

A REVIEW OF *ETEONE* SAVIGNY, 1820, *MYSTA* MALMGREN, 1865
AND *HYPERETEONE* BERGSTRÖM, 1914 (POLYCHAETA: PHYLLODOCIDAE)

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Abstract

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Eteone sensu lato is reviewed and three genera recognised: *Hypereteone* Bergström, 1914 is resurrected and redefined; *Mysta* Malmgren, 1865 is retained unchanged and *Eteone* Savigny, 1820 is redefined to include all remaining species. *Hypereteone* now comprises nine nominal species including *H. otati* and *H. tingara* which are described as new species. An apparently undescribed species of *Hypereteone* is also recognised and *H. alba* (Webster, 1879), *H. barantollae* (Fauvel, 1932), *H. fauchaldi* (Kravitz and Jones, 1979), *H. foliosa* (Quatrefages, 1865), *H. heteropoda* (Hartman, 1951) and *H. lighti* (Hartman, 1936a) are proposed as new combinations. *Mysta* now includes seven nominal species and one undescribed form, and *M. platycephala* (Augener, 1913) is proposed as a new combination. *Eteone* sensu stricto now includes 28 nominal species of which four are designated *nomina dubia*. *Eteone palari* and *E. tulua* are described as new species. Keys are provided to distinguish the three genera and all well-described species within each genus. Australian species in all three genera are distinguished in a separate key.

Introduction

Phyllococid polychaetes with two pairs of tentacular cirri on the first segment and lacking tentacular cirri on subsequent segments were placed by Bergström (1914) in three genera: *Eteone* Savigny, 1820 (species with setae and neuropodia on the first post-tentacular segment, proboscis lacking rows of papillae); *Mysta* Malmgren, 1865 (setae and neuropodia on first post-tentacular segment, proboscis with two lateral rows of large papillae); and *Hypereteone* Bergström, 1914 (first post-tentacular segment without setae or neuropodia, proboscis lacking rows of papillae). Most subsequent authors have retained *Mysta* as a distinct genus (Fauchald, 1977) or subgenus of *Eteone* (Uschakov, 1974; Hartmann-Schröder, 1971) whereas *Hypereteone* has been synonymised with *Eteone* by all authors except Hartmann-Schröder (1971).

In the course of this study I have arrived at a revised generic classification of species with only two pairs of tentacular cirri (on the first segment). I believe this arrangement best represents the natural relationships within the group. *Mysta* is retained as defined by Bergström, *Hypereteone* is revised to include all species with long tapered anal cirri, and *Eteone* sensu stricto contains all remaining species. In this scheme, although *Mysta* and

Hypereteone appear to be monophyletic taxa, *Eteone* may be paraphyletic since it is characterised by absence of the characters which define related taxa (the heterogeneity of structures, particularly proboscis and setae, seen within species of *Eteone* is further indication that this genus does not represent a natural taxon).

The classification of the Phyllococidae proposed by Bergström (1914) placed *Eteone*, *Hypereteone* and *Mysta* in the subfamily Eteoninae, together with *Pseudomystides* (which differs from the three genera treated here in having three pairs of tentacular cirri arranged on two segments) and *Pelagobia* (now placed in the family Lopadorhynchidae (Fauchald, 1977)). Bergström's subfamilial classification has been rejected by most recent authors (e.g. Uschakov, 1974) as not phylogenetically valid, however the three genera treated in this paper clearly represent a natural group, being defined by an arrangement of tentacular cirri which is unique in the family. The term *Eteone* genus-group is employed here for the convenience of referring to all three genera.

I have not attempted a strictly phylogenetic arrangement of genera and species, both because the material of many species is inadequate but also because present knowledge is such that it is not possible to carry out a cladistic analysis. (It is not clear which taxa would provide appropriate outgroup(s)

to establish character polarities, and as set out below, ontogenetic evidence appears to be uninformative in this family.) The following comments, which include a summary of the views of Uschakov (1974), are pertinent to this and future studies of the relationships of these genera. All authors agree that the degree of fusion and the number of appendages of anterior segments are of critical importance in arriving at a natural classification of genera. Bergström proposed that the evolutionary trend in the family was towards fusion of anterior segments and loss of aciculae, setae and tentacular cirri. The inference was that an additional anterior segment (carrying an additional pair of tentacular cirri) was present in the primitive form and that the *Eteone* genus-group represents an advanced condition, having lost the first segment and first pair of tentacular cirri, setae and aciculae from the second segment, and dorsal cirri from the third segment (of the primitive form). Bergström's views were based in part on anatomical study of the anterior nervous system; this appears to be a valid method of establishing homologies, however I have found it impossible to observe any detail of the nervous system in my dissections.

As set out fully by Wiley (1981), morphological change during ontogeny can be interpreted as passing through a series of plesiomorphic (primitive) character states prior to reaching the terminal derived condition. Thus Uschakov (1974) has noted that metatrochophore larvae of the *Eteone* genus-group already possess a single anterior segment with two pairs of tentacular cirri and inferred that this was the primitive condition. However, Nolte (1938) has published figures of larvae of several phyllocid genera which invariably show that the arrangement of tentacular cirri found in adults is already present in metatrochophores. Similarly, Cazaux (1985) has described and figured the larval stages of *Mysta picta* from the Bay of Arachon (in the Bay of Biscay), showing that two pairs of tentacular cirri appear at the metatrochophore II stage (5 setigers) and that earlier larval stages lack tentacular cirri entirely. Cazaux also provided a table comparing larval development in *Phyllococe*, *Eulalia* and *Eteone*; in each genus the adult condition appears at the metatrochophore II stage and no primitive arrangements of tentacular cirri are recognisable. Ontogenetic evidence, though arguably not sufficient in itself to establish character polarities (since neoteny cannot be excluded), nevertheless does not contribute to the debate as to which arrangement of tentacular cirri is the most primitive.

Uschakov's (1974) evolutionary scenario

hypothesises a primitive phyllocid in which all segments are similar; subsequently anterior segments one by one lost their setae and the dorsal and ventral cirri were transformed into long tentacular cirri. Finally, in some forms one or more anterior segments became fused and some tentacular cirri were lost. Thus the position of the *Eteone* genus-group could be primitive (having only the first segment modified, as suggested by Uschakov) or advanced (having been derived by fusion of anterior segments and loss of tentacular cirri from forms with several anterior segments modified, as proposed by Bergström). The question can only be resolved if the two pairs of tentacular cirri of the *Eteone* genus-group can be identified with homologous cirri in other genera, possibly through histological study of the nervous system.

Questions relating to phyllocid phylogeny and the identity of poorly described species are unlikely to be fully resolved if only type material is studied. Carefully collected, narcotised and preserved specimens with probosces fully everted are required to adequately describe taxonomically important structures, especially in small specimens. This will be particularly important if histological techniques are utilised to aid study of the anterior nervous system.

Materials and methods

Morphological descriptions in this review generally recognise the importance of characters described by earlier workers. Two exceptions are the form of the anal cirri, which I consider to be of generic significance although description of anal cirri is omitted from many earlier descriptions; and the head of the setal shaft at the articulation of the blade, which provides characters which assist in distinguishing species. Where possible I have examined setae from the same specimen under both light microscope and scanning electron microscope (SEM). The setae are too small to resolve fine detail of the small teeth on the shaft (at the point of articulation with the blade) with light microscopy, however the setae are partly transparent under the light microscope and the useful specific character of the relative size of the large teeth (equal or unequal in size) is best observed in this way. SEM examination is essential if the fine structure is to be seen, but can wrongly indicate that only one large tooth is present unless coupled with light microscopy. SEM preparations for this paper are mostly from type material, thus only one or two parapodia could be removed for examination. Individual parapodia were subjected to ultrasonic cleaning for about 30 seconds before being air dried from 100% ethanol, mounted on stubs with

double-sided tape and gold coated before examination in a Philips SEM 505. The micrographs obtained by this method were variable and not always of publishable quality, however the critical structures could usually be seen clearly. Poor quality micrographs were used to trace line drawings and all figures of setae presented here were prepared in this way. The remaining figures were prepared with camera lucida attachments on stereo and compound microscopes. Location of all SEM stubs is given in the material examined sections of the species accounts.

There does not appear to be any significant variation in setal morphology from different parapodia, however due to the scarcity of material only the two most common Australian species, *Eteone palari* and *Mysta platycephala* have been examined in detail for such variation.

The shape of the dorsal cirri is useful in distinguishing many species. It is usually necessary to figure dorsal cirri for accurate descriptions, however in an attempt to standardise written descriptions the reader is referred to the following examples of descriptive terms for parapodial lobes used in this paper: ovoid, figs 2h, 4g; ovoid lanceolate, fig. 4b; lanceolate, fig. 5d; asymmetrical circular-ovoid, fig. 3d; rounded quadrangular, fig. 1d; trapezoid, fig. 2c; triangular acuminate, fig. 10d.

Since there is some intraspecific variability in the segment on which setae appear (in *Eteone spetsbergensis* and several species of *Hypereteone*), all descriptions use counts from the first segment (i.e. the segment carrying the tentacular cirri). Size and numbers of segments are given for the range of material examined; this information includes two width measurements in mm taken at segment 10: the first is body width excluding parapodia, and the second (in parentheses) including parapodia but excluding setae. Measurements were made with an eyepiece graticule on a stereo microscope; length of large specimens was simply measured against a mm scale. Width measurements of the anterior margin of the prostomium were taken between the points of insertion of the most dorsal pair of antennae. Left and right hand side parapodia are denoted LHS and RHS respectively.

The Australian material on which this study is based has come from several intensive benthic surveys of soft-sediment communities: Moreton Bay, Qld (Stephenson et al., 1974; Stephenson et al., 1976); NSW Shelf Benthic Survey (Jones, 1977); Bass Strait (Wilson and Poore, 1987); Port Phillip Bay and Western Port, Vic. (Poore, 1986); North-west Shelf, WA (Australian Museum material, col-

lected by CSIRO). All phyllodocids from all Australian state museums have also been examined; this material includes collections from a variety of other habitats, however species of *Eteone*, *Mysta* and *Hypereteone* were only encountered in soft-sediment collections. It is noteworthy that this group was not recorded from the intensive benthic survey of soft-sediment communities in Bass Strait cited above, although the most widespread species, *Mysta platycephala*, is common in nearby Port Phillip Bay.

It has not been possible to undertake an exhaustive search for types of all taxa, however type material of many species has been examined and these species are redescribed below. Where types have not been examined (either because there seemed little confusion as to the identity of the species or because the types were not available for study) a brief description taken from the most appropriate paper is included in the *Remarks* section of the species account. The following list summarises institution codes referred to hereafter:

AHF, Allan Hancock Foundation, University of Southern California, United States of America
AM, Australian Museum, Sydney, Australia
BMNH, British Museum (Natural History), London, England

HZM, Zoologisches Institut and Museum, Universität Hamburg, Hamburg, Federal Republic of Germany

MNHN, Muséum National d'Histoire Naturelle, Paris, France

NMV, Museum of Victoria, Melbourne, Australia

QM Queensland Museum, Brisbane, Australia
SMNH; Swedish Museum of Natural History, Stockholm, Sweden

USNM, National Museum of Natural History, Smithsonian Institution, Washington D.C., United States of America

WAM, Western Australian Museum, Perth, Australia

YPM, Peabody Museum of Natural History, Yale University, New Haven, Connecticut, United States of America

ZMO, Zoologisk Museum, Oslo, Norway.

The following list includes all species of *Eteone*, *Hypereteone* and *Mysta* recognised or synonymised in this paper. The list excludes many nominal species of *Eteone* and *Mysta* which have been moved to other genera by Hartman (1959, 1965). Questionable synonymies are discussed in the *Remarks* section of the supposed senior synonym. Genera and species in the systematic account are arranged in alphabetic order, except *nomina dubia* and other

poorly-known species which are listed separately in an Appendix.

aestuarina (Hartmann-Schröder, 1959);

Hypereteone

alba (Webster, 1879); *Hypereteone*

andreapolis McIntosh, 1874; = *Eteone*
spetsbergensis?

arctica Malmgren, 1867; = *Eteone longa*

armata Claparède, 1868; = *Mysta picta*?

bulbocnsis Hartman, 1936a; *Eteone*

barantollae (Fauvel, 1932); *Hypereteone*

barbata (Malmgren, 1865); *Mysta*

bistriata Uschakov, 1953; = *Eteone*
spetsbergensis

caeca Ehlers, 1874; = *Hypereteone foliosa*?

californica Hartman, 1936a; *Eteone*

cinerea Webster and Benedict, 1884; = *Eteone*
longa?

columbiensis Kravitz and Jones, 1979; *Eteone*

crassifolia Ehlers, 1900; = *Eteone sculpta*?

cylindrica Ørsted, 1842; *Eteone nomen dubium*
(see Appendix)

delta Wu and Chen, 1963; *Eteone*

depressa Malmgren, 1865; = *Eteone flava*

dilatata Hartman, 1936a; *Eteone*

fauchaldi (Kravitz and Jones, 1979);

Hypereteone

filiformis Hartman-Schröder, 1980; *Eteone*

flava (Fabricius, 1780); *Eteone*

foliosa (Quatrefages, 1865); *Hypereteone*

fucata Sars, 1872; *Eteone*

geoffroyi (Audouin and Milne-Edwards, 1834);
= *Mysta picta*?

heteropoda (Hartman, 1951); *Hypereteone*

incisa Saint-Joseph, 1888; = *Mysta picta*?

islandica Malmgren, 1867; = *Eteone longa*

japanensis McIntosh, 1901; *Eteone*

lactea (Claparède, 1868); *Hypereteone*, =
Hypereteone foliosa?

lentigera Malmgren, 1967; = *Eteone flava*

leuckarti Malmgren, 1867; = *Eteone longa*

lighti (Hartman, 1936a); *Hypereteone*

hilljeborgi Malmgren, 1867; = *Eteone longa*

limicola Verrill, 1873; *Eteone*

longa (Fabricius, 1780); *Eteone*

maculata Ørsted, 1843; *Eteone nomen dubium*
(see Appendix)

maculata Treadwell, 1920; *Mysta*

maculata Treadwell, 1922; JUNIOR HOMO

NYM, = *Eteone pacifica*

malmgreni Michaelsen, 1897; = *Hypereteone*
foliosa?

ornata Grube, 1878; *Mysta*

otati sp. nov.; *Hypereteone*

pacifica Hartman, 1936b; *Eteone*

palari sp. nov.; *Eteone*

papillifera Théel, 1879; = *Mysta barbata*

picta (Quatrefages, 1865); *Mysta*

picta Ehlers, 1873; JUNIOR HOMONYM, =
Eteone spetsbergensis?

platycephala (Augener, 1913); *Mysta*

pusilla Ørsted, 1843; *Eteone nomen dubium* (see
Appendix)

reyi Gravier, 1906; = *Eteone sculpta*?

robertianae (McIntosh, 1874); *Eteone*

robusta Verrill, 1873; = *Eteone longa*

rubella Ehlers, 1900; = *Eteone sculpta*

sarsii Ørsted, 1843; = *Eteone flava*?

setosa Verrill, 1873; *Eteone nomen dubium* (see
Appendix)

sculpta Ehlers, 1897; *Eteone*

spetsbergensis Malmgren, 1865; *Eteone*

spilotus Kravitz and Jones, 1979; *Eteone*

striata Bobretzky, 1868; = *Mysta picta*?

striata Levinsen, 1882; JUNIOR HOMONYM,
= *Mysta picta*?

suecica Bergström, 1914; *Eteone*

syphodonta (delle Chiaje, 1822); *Mysta*

tchangsii Uschakov and Wu, 1959; *Mysta*

tetraophthalma Schmarda, 1861; *Eteone*

tingara sp. nov.; *Hypereteone*

tocantinensis Nolte, 1938; ?*Eteone* (see
Appendix)

triangulifera Augener, 1913; *Mystides**

trilineata Webster and Benedict, 1887; *Eteone*

tuberculata Treadwell, 1922; *Eteone*

tulua sp. nov.; *Eteone*

villosa Levinsen, 1882; = *Eteone longa*?

vitiazi Uschakov, 1974; *Eteone*

**Eteone triangulifera* Augener, 1913 was referred to the genus *Mystides* by Augener (1924b) who believed that a third pair of tentacular cirri had been lost from the specimens. I have examined the type material of *E. triangulifera* Augener (HZM V-7904) which includes two specimens: one agrees with the original description of *E. triangulifera* and one is a species of Syllidae. Only three single tentacular cirri are now intact on the syntype and the typical prostomial pigmentation described by Augener (1913, 1924b) has faded. The minute size of the specimen, the almost circular prostomium with long threadlike antennae and the tentacular cirri which are swollen basally and taper to a long fine tip all indicate that this species should be placed in the genus *Mystides* as proposed by Augener (1924b).

Key to genera of Phyllodocidae with two pairs of tentacular cirri on the first segment

1. Anal cirri at least 5 times as long as width at base, tapering to a pointed tip; proboscis with 3 or more longitudinal rugose ridges or rows of low tuberculate papillae *Hypereteone*
- Anal cirri digitiform or nearly spherical with blunt rounded tip, no more than 4 times as long as wide; proboscis not as above 2
2. Proboscis with 2 lateral longitudinal rows of foliose papillae and a dorsal band of very small denticulate papillae *Mysta*
- Proboscis usually smooth basally, rugose distally, without longitudinal rows of papillae or numerous longitudinal rugose ridges (note: in the retracted position the proboscis may invert to produce a single longitudinal fold which is however absent when the proboscis is preserved in the everted position) *Eteone*

Genus *Eteone* Savigny, 1820

Diagnosis. Phyllodocidae with 4 antennae, 2 pairs of tentacular cirri on the first segment. Second segment lacking dorsal cirri. Proboscis smooth and/or rugose, lacking longitudinal ridges or rows of papillae. Anal cirri short, globular to digitiform with rounded tips, no more than 4 times as long as wide.

Type species. *Nereis flava* Fabricius, 1780 (fide Hartman, 1959, original designation unknown).

Remarks. *Eteone* is defined here to exclude *Mysta* and *Hypereteone* and probably does not represent a natural group (see introductory comments above). At present *Eteone* contains a heterogeneous assortment of species including *E. filiformis*, *E. robertianae* and *E. tetraophthalma* which appear to be unlike all remaining species; the genus may need to be further divided when the phylogenetic relationships of the species become more clear.

Key to species of *Eteone*

Provision of a key to a genus where many species are poorly described or known from inadequate material demands compromise; the key excludes *nomina dubia* and the following species which appear to be distinct but could not be adequately described here: *E. balboensis* Hartman, 1936a; *E. fucata* M. Sars, 1872; *E. limicola* Verrill, 1873; *E. pacifica* Hartman, 1936b; *E. tetraophthalma* Schmarda, 1861; *E. tocantinensis* Nolte, 1938; *E. tuberculata* Treadwell, 1922; *E. vitiazi* Uschakov, 1974.

1. Prostomium and first segment wholly or partly fused; tentacular cirri narrow, threadlike 2
- Prostomium and first segment clearly delineated; tentacular cirri stout basally, tapering and narrower distally 3
2. Body narrow, threadlike (< 0.2 mm wide); first 2 segments not noticeably constricted; dorsal tentacular cirri longer than ventral tentacular cirri ..
..... *E. filiformis*
- Body not thin and threadlike (> 0.5 mm wide); segments 1 and 2 strongly constricted; tentacular cirri equal in length *E. robertianae*
3. Prostomium as long or longer than maximum width 4
- Prostomium wider than long 10
4. Dorsal pair of tentacular cirri longer than ventral pair *E. tulua*
- Dorsal and ventral tentacular cirri equal in length 5
- Dorsal pair of tentacular cirri shorter than ventral pair 9
5. Antennae narrow, threadlike *E. japonensis*
- Antennae stout basally, tapering distally 6
6. Proboscis terminating in ring of globular papillae 7
- Proboscis without terminal ring of papillae *E. spetsbergensis*
7. Ventral cirri present from third segment; dorsal cirri circular-ovoid throughout *E. dilatata*
- Ventral cirri present from second segment; dorsal cirri of anterior 10 seg-

- ments quadrangular with rounded corners 8
8. Prostomium a truncate triangle; body not conspicuously pigmented ...
..... *E. californica*
9. Prostomium distally very narrow, lateral margins concave; dorsum with
heavily pigmented dark brown transverse bands and spots ... *E. spilotus*
9. Nuchal papilla absent; anal cirri club-shaped, with distal knob
..... *E. columbiensis*
- Nuchal papilla present; anal cirri spherical *E. delta*
10. Dorsal pair of tentacular cirri longer than ventral pair 11
- Both pairs of tentacular cirri similar in length 12
11. Proboscis lacking terminal ring of papilla; setae with single large tooth and
several smaller teeth; dorsum with conspicuous transverse brown bars ...
..... *E. palari*
- Proboscis with terminal ring of papillae; setae with 2 large teeth equal in
size and several smaller teeth; dorsum not conspicuously pigmented ...
..... *E. trilineata*
12. Proboscis with terminal ring of papillae 13
- Proboscis without terminal ring of papillae 14
13. Dorsal cirri quadrangular anteriorly, ovoid posteriorly; anal cirri digitiform,
2–3 times as long as wide *E. longa*
- Dorsal cirri roughly circular; anal cirri spherical globes ... *E. sculpta*
14. Ventral cirri with pointed tips; ventral pair of antennae longer than dorsal
pair; setae with 2 large teeth equal in size *E. suecica*
- Ventral cirri with rounded tips; antennae equal in size; setae with 2 large
unequal teeth *E. flava*

Eteone balboensis Hartman

Figures 1a, 14a

Eteone balboensis Hartman, 1936a: 131, figs 49–51, southern California.

Material examined. USA, California, Newport Bay, 12 Oct 1935, O. Hartman, "S 151", USNM 20337, labelled "type" (in Hartman's hand-writing) and "holotype" on a separate label, SEM stub NMV F53920 median RHS parapodium.

Description. The holotype is a headless posterior fragment of 177 segments, 35 mm long, 1.0 (1.7) mm maximum width. Colour in alcohol light brown throughout, no markings or patterns. Dorsal cirri longer than wide, ovoid with rounded tips initially, similar in size but lanceolate with acuminate tips posteriorly. Neuropodia and ventral cirri ovoid-lanceolate, similar in size and shorter than dorsal cirri throughout (fig. 1a). Anal cirrus (one of the pair is lost) digitiform with rounded tip, 3 times as long as wide. Setae with 2 large rounded teeth equal in size and numerous smaller teeth (fig. 14a).

Remarks. Hartman's (1936a) original description includes the following additional information: prostomium about three-quarters as long as wide, without eyes but with nuchal papilla; dorsal cirri symmetrical, longer than wide, rectangular in

median region, trapezoidal posteriorly; ventral cirri smaller than neuropodia except on anterior 10–15 segments.

The structure of the proboscis and the form of the anal cirri remain unknown; this information is required before the identity and generic placement of this species can be confirmed.

Distribution. California, USA.

Eteone californica Hartman

Figures 1b–e, 14b

Eteone californica Hartman, 1936a: 131, figs 43–46 (Southern California). – Hartman, 1948: 20, 21, figs 4a–d (Alaska). – Kravitz and Jones, 1979: 9 (Northern Oregon and Southern Washington).

Material examined. USA, California, Berkeley Beach, San Francisco Bay, Nov 1932, coll. and don. O. Hartman, USNM 20339, 2 syntypes, 2 SEM stubs NMV F53921, F53922 segments 11 and 16 RHS parapodia from entire syntype.

Description. Entire syntype 85 segments, 15 mm long, 0.4 (0.7) mm wide; anterior fragment 28 segments, 3.5 mm long, 0.3 (0.6) mm wide. Prostomium slightly longer than wide, tapering anteriorly, anterior margin half width of posterior margin (fig. 1b). Anterior region of prostomium distinctly lobular, divided from posterior two-thirds of

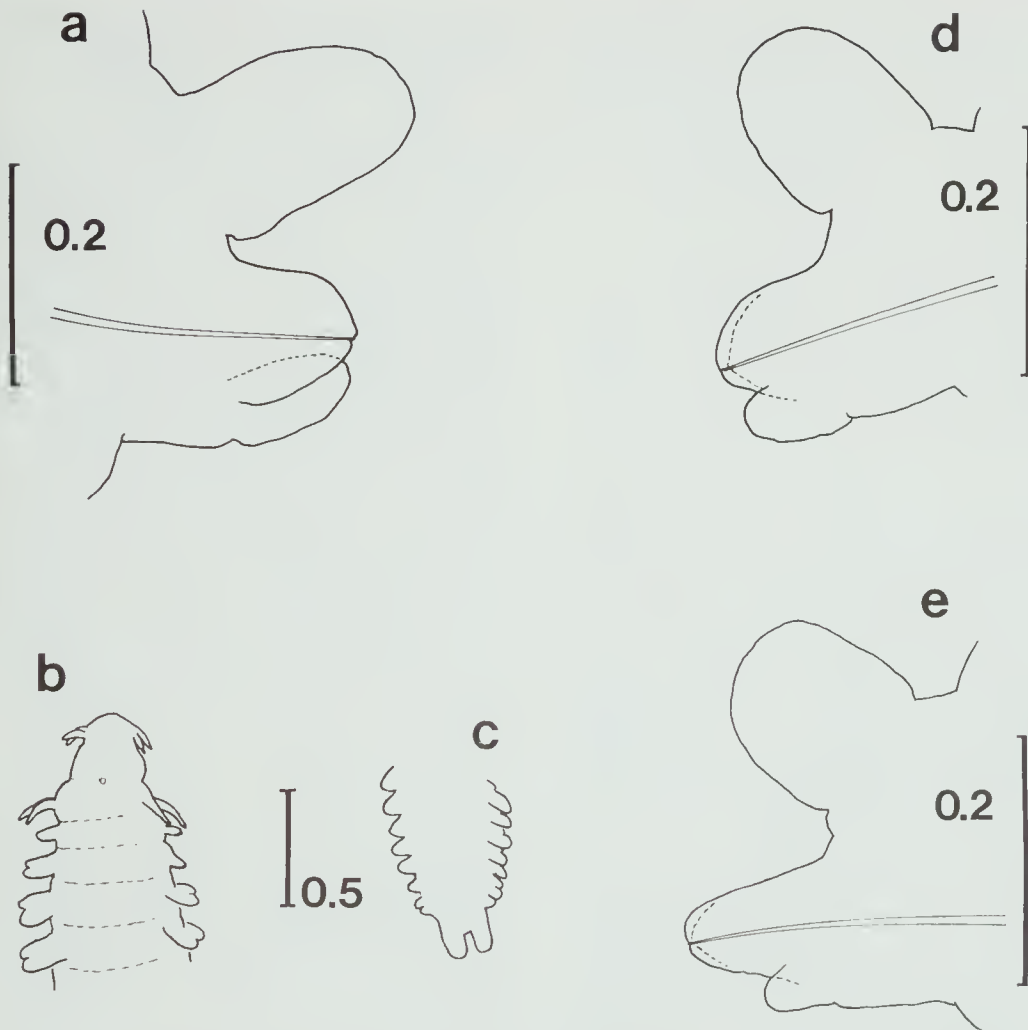


Figure 1. a, *Eteone balboensis*, anterior view median parapodium, USNM 20337 holotype. b–e, *Eteone californica* USNM 20339 larger of 2 syntypes: b, dorsal view prostomium; c, anal cirri; d, setiger 10 parapodium anterior view; e, setiger 50 parapodium anterior view. Scale bars in mm.

prostomium by a constriction. Antennae laterally inserted on globular tip region of prostomium, as long as anterior width of prostomium, with blunt tips. Prostomium with median dorsal groove from posterior margin almost to the tip. One pair of faint red sub-dermal eyes close to posterior margin of prostomium and nuchal papilla located at posterior margin of prostomium. Proboscis, examined through ventral dissection, smooth basally, distally with dorsal ridge and 6–8 diagonal lines on each side giving distal region a rugose appearance. Proboscis terminating in ring of small globular papillae. Tentacular cirri of similar length to antennae but tapering from stout base to fine tip, posteri-

only inserted on segment 1. Segment 2 with setae, neuropodial lobes and ventral cirri of similar size and flattened digitiform shape. Dorsal cirri present from segment 3, quadrangular and equal in length to neuropodium. Dorsal cirri and neuropodia of similar length and proportions throughout except on posterior-most segments where dorsal cirri become relatively broader and neuropodia acuminate. Ventral cirri similar in size to neuropodia on anterior 10 segments, reduced posteriorly, significantly smaller by segment 20 and by segment 30 reduced to small digitiform process attached to ventral neuropodial margins (figs 1d, e). Anal cirri laterally inserted, digitiform and 3 times as long

as wide (fig. 1c). Setae with pair of large teeth and 3 tiers each of about 4 or 5 smaller teeth (fig. 14b).

Distribution. West coast of North America from southern California to Alaska.

***Eteone columbiensis* Kravitz and Jones**

Figures 2a-d, plate 1a

Eteone columbiensis Kravitz and Jones, 1979: 10-12, figs 3d-g. Columbia River, west coast USA.

Material examined. USA, northern Oregon/southern Washington, off Columbia River mouth, 46°14.98'N, 124°04.83'W, Stn 217D grab 3, 14 m, 26 Jun 1975, A. Carey, 2 paratypes, USNM 57963; SEM stub NMV F53923 segment 11 parapodium from larger of 2 paratypes.

Description. Two entire specimens, 126 segments, 17 mm long, 0.4 (0.5) mm wide and 196 segments, 26 mm long, 0.5 (0.6) mm wide. Prostomium almost twice as long as maximum width at posterior margin, narrowing sharply in mid-section so that anterior half through to anterior margin is third width at posterior margin. Antennae equal in length to width of prostomium at posterior margin. Prostomium with median dorsal groove and pair of dark red eyes at posterior margin; nuchal papillae not visible (fig. 2a). Proboscis fully retracted (not previously dissected in either paratype) narrow and difficult to see, apparently smooth basally and covered with minute papillae distally, with terminal ring of 15 or more large papillae. Ventral tentacular cirri third as long as width of first segment, dorsal pair slightly shorter. Second segment with setae, ovoid neuropodia and smaller digitiform ventral cirri. Dorsal cirri present from segment 3, initially half length of neuropodia and trapezoid in shape, narrower at base than on distal margin, distal margin slightly rounded. Dorsal cirri becoming proportionately larger posteriorly, as long as neuropodia by segment 40 and more rounded in outline. Ventral cirri asymmetrical, ovoid and smaller than neuropodia throughout. Cirri and neuropodia of similar proportions posterior to segment 40 but reducing in overall size on posterior-most segments (figs 2c, d). Anal cirri stout with distinct distal knob, twice as long as wide and as long as last 3 or 4 segments (fig. 2b). Setae with 1 large tooth with slightly smaller tooth on each side and many successively smaller teeth in 5 or 6 tiers (pl. 1a).

Remarks. *Eteone columbiensis* has distinctive setae which are unlike those of any other species examined in this study.

Distribution. Known only from the original

material collected from off the mouth of the Columbia River, west coast of the USA.

***Eteone delta* Wu and Chen**

Eteone delta Wu and Chen, 1963: 18, 19 (in Chinese), 30 (in English), fig. 1, pl. 1 figs a-e, pl. 2 fig. a. Yangtse River Delta, Shanghai, China. — Uschakov, 1974: 167, pl. 16 figs 1-6 (record repeated).

Remarks. A summary of the critical taxonomic characters is as follows (from Wu and Chen, 1963): prostomium as long as wide, with biarticulate antennae. One pair of black eyes. Nuchal papilla at posterior margin of prostomium. Dorsal pair of tentacular cirri slightly shorter than ventral pair. Everted proboscis slightly wrinkled but otherwise smooth, distal end with circle of 12 subglobular cirri surrounding the orifice. Setae present from second segment. All parapodial lobes subquadrangular with rounded tips. Dorsal and ventral cirri shorter than neuropodia in middle and anterior regions but both cirri exceed length of neuropodia in posterior-most segments. Anal cirri short, globular. Setae with 1 large tooth and series of smaller teeth at end of shaft.

Distribution. Known only from the Yangtse River Delta, Shanghai, China.

***Eteone dilatata* Hartman**

Figures 2e-h, plate 1b

Eteone dilatata Hartman, 1936a: 130, 131, figs 40-42. Central California.

Material examined. USA, California, Dillon Beach, Jul 1933, coll. Williams, USNM 20338, syntype; SEM stubs NMV F53924, F53925 segments 11 and 21 LHS parapodia.

Description. An anterior fragment with proboscis fully everted, 84 segments, 26 mm long, 0.9 (1.1) mm wide; and a posterior fragment, tightly coiled, of 253 segments (the posterior fragment exceeds the diameter of the anterior and it is possible that 2 individual worms are represented). Colour pale yellow, no markings. Prostomium longer than wide, triangular with anterior point slightly bulbous and truncate. Antennae as long as anterior width of prostomium. One pair of faint red sub-dermal eyes present close to posterior margin of prostomium and small nuchal papilla on posterior margin. A median dorsal groove runs from posterior margin almost to tip of prostomium (fig. 2e). Everted proboscis as long as anterior 12 segments, without papillae and smooth over proximal four-fifths, a constriction dividing the distal fifth which is slightly rugose, with terminal ring of 15 or more irregular globular papillae (fig. 2e). Ten-

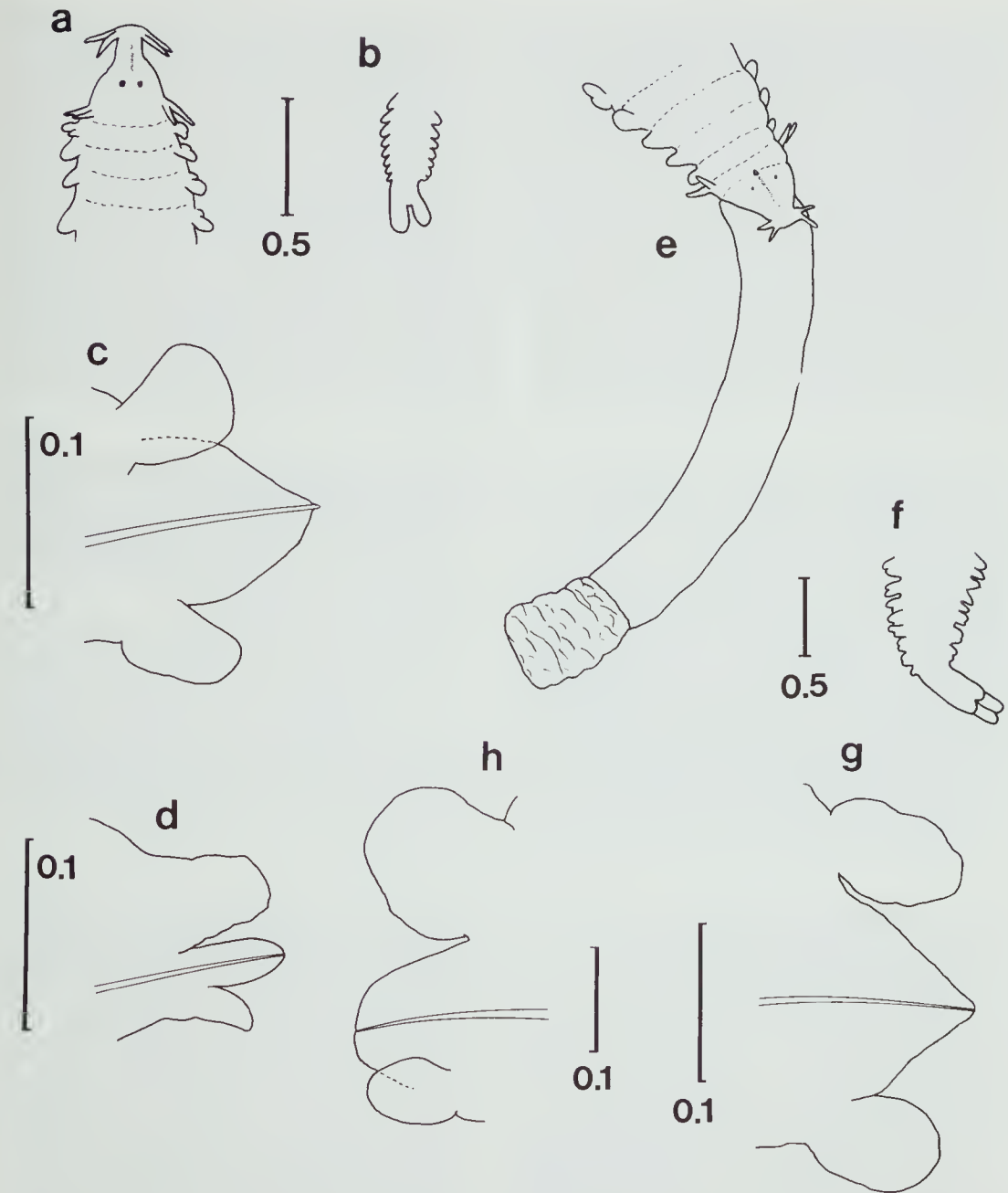


Figure 2. a-d, *Eteone columbiensis* USNM 57963 larger of 2 paratypes: a, dorsal view prostomium; b, anal cirri; c, setiger 10 parapodium posterior view; d, setiger 40 parapodium posterior view. e-h, *Eteone dilatata* USNM 20338 syntype: e, prostomium and everted proboscis dorsal view; f, anal cirri and ventral lappets ventral view; g, setiger 10 parapodium anterior view; h, setiger 50 parapodium anterior view. Scale bars in mm.



a



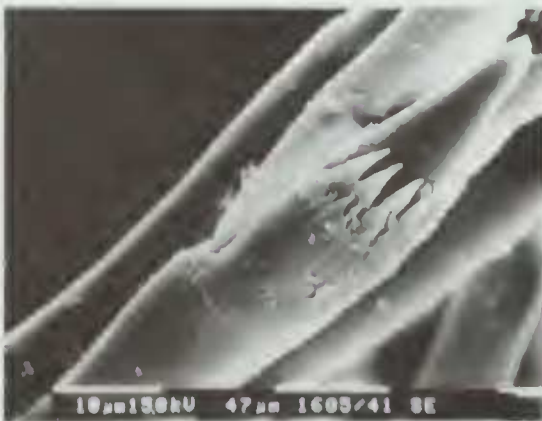
b



c



d



e



f

Plate 1. Scanning electron micrographs of setae of species of *Eteone*: a, *E. columbiensis* USNM 57963 (larger of 2 paratypes (from setiger 10)); b, *E. dilatata* USNM 20338 paratype (from setiger 20); c, *E. flava* (*E. depressa* SMNH 2413 syntype from setiger 10); d, *E. longa* (*E. arctica* SMNH 2408 syntype, from setiger 10); e, f, *E. palari* QM GH3577 holotype (from setiger 25). Scale bars in μm .

lacular cirri equal in length, slightly shorter than antennae. Second segment with setae and very small neuropodia, ventral cirri absent. Rudimentary dorsal and ventral cirri present on segments 3 and 4, becoming fully developed posteriorly. Dorsal cirri small and ovoid anteriorly, becoming circular from about segment 35. Neuropodia ovate, anteriorly twice as long as dorsal cirri but reducing posteriorly so that dorsal cirri and neuropodia of equal length by about segment 40. Ventral cirri ovoid to circular, attached to ventral neuropodial margin, anteriorly about as long as dorsal cirri and remaining small throughout (Figs 2g, h). Anal cirri about 2 or 3 times as long as wide and as long as posterior 2 or 3 segments; pygidium also with pair of knob-like ventral lappets (fig. 2f). Setae with pair of large rounded teeth, equal or only slightly dissimilar in size, and numerous small teeth in 3 or 4 tiers (pl. 1b).

Remarks. There is some confusion as to the status of the USNM type material. The original label, in Hartman's hand-writing, states "type", and the original descriptions state that holotypes of all species described by Hartman (1936a) were deposited with the USNM, yet the type locality, "outer side of Bodega sand spit, Sonoma County" does not agree with the present material from Dillon Beach, Marin County (this locality was listed by Hartman but not as type locality). The label shows that Hartman intended that this material should be designated as types and they are here treated as syntypes.

The description above agrees with that of Hartman (1936a) except that the proboscidal papillae recorded by Hartman were absent from the USNM syntype. The "soft papillae on the distal half" noted by Hartman may correspond to the ringed distal portion of the proboscis as described here.

Distribution. California, west coast USA.

Eteone filiformis Hartman-Schröder

Eteone filiformis Hartman-Schröder, 1980: 45, 46, figs 19-22.

Material examined. Australia, WA, Port Samson, mangrove estuary south of the town, sand with shell and much plant detritus, 1 Oct 1975, coll. G. Hartman-Schröder, HZM P-16206, 2 paratypes.

Description. Two entire specimens; 124 segments, approx. 8 mm long; 109 segments, approx. 12 mm long; both approx. 0.15 mm wide (0.2 mm). Prostomium and first segment fused, no external sign of any division or septum; together almost twice as long as wide, maximum width at posterior margin about twice width at anterior margin.

Antennae threadlike, as long as width of prostomium at anterior margin. One pair of brown eyes on posterior quarter of prostomium. Tentacular cirri threadlike, located slightly behind eyes. Dorsal pair of tentacular cirri about half as long as posterior width of prostomium, ventral pair slightly shorter. First distinct segment with setae, digitiform neuropodia and ventral cirri. Dorsal cirri ovoid, present from segment 2. Neuropodium with rounded margin and slightly longer than dorsal cirri throughout. Ventral cirri ovoid and as long as neuropodia. Parapodial lobes similar throughout. Anal cirri almost spherical lobes. Setae appear to have 2 equal or only slightly dissimilar large teeth and 1 or 2 tiers of smaller teeth.

Remarks. *Eteone filiformis* is known only from the holotype and two paratypes; all are minute threadlike specimens which are unlike any other species of *Eteone*. The holotype figured by Hartman-Schröder (1980) has a proboscis which is smooth but apparently only partly everted. The type material is too small and scarce to attempt to dissect the proboscis or mount material for SEM examination of setae.

Distribution. Known only from the original material, Port Samson, north western Western Australia.

Eteone flava (Fabricius)

Figures 3a-e, plate 1c

Nereis flava Fabricius, 1780. West Greenland.

Eteone flava. Uschakov, 1974: 165, 166, pl. 15 figs 4-7. Synonymy.

Eteone depressa Malmgren, 1865: 103, pl. 15 figs 36a-d. Spitsbergen and Greenland. - Malmgren, 1867: 149 (record repeated).

Eteone lentigera Malmgren, 1867: 149, 150, pl. 3 figs 13a-d. Spitsbergen.

Material examined. Svalbard (Spitsbergen), Bellstrand, 30-40 fm [55-73 m], O. Torell, SMNH 2413, 5 syntypes of *E. depressa*, SMNH SEM stub segment 11 LHS parapodium; Bellstrand, 30-40 fm [55-73 m], steng terb., 1858, O. Torell, SMNH 2414, 3 syntypes of *E. depressa*; Tremenberg Bay, Spitsbergen Expedition 1861, SMNH 359, 2 syntypes of *E. lentigera*.

Description. (based on *E. depressa* syntypes) The syntype series includes at least 8 specimens, comprising 3 entire worms (size range 106 segments, 39 mm long, 1.5 (2.1) mm wide to 136 segments (regenerating posteriorly), 88 mm long, 2.3 (3.9) mm wide), 5 anterior fragments (largest 67 segments, 40 mm long (excluding everted proboscis 9 mm), 2.7 (4.4) mm wide), 7 median fragments and 3 posterior fragments. Colours in alcohol pale

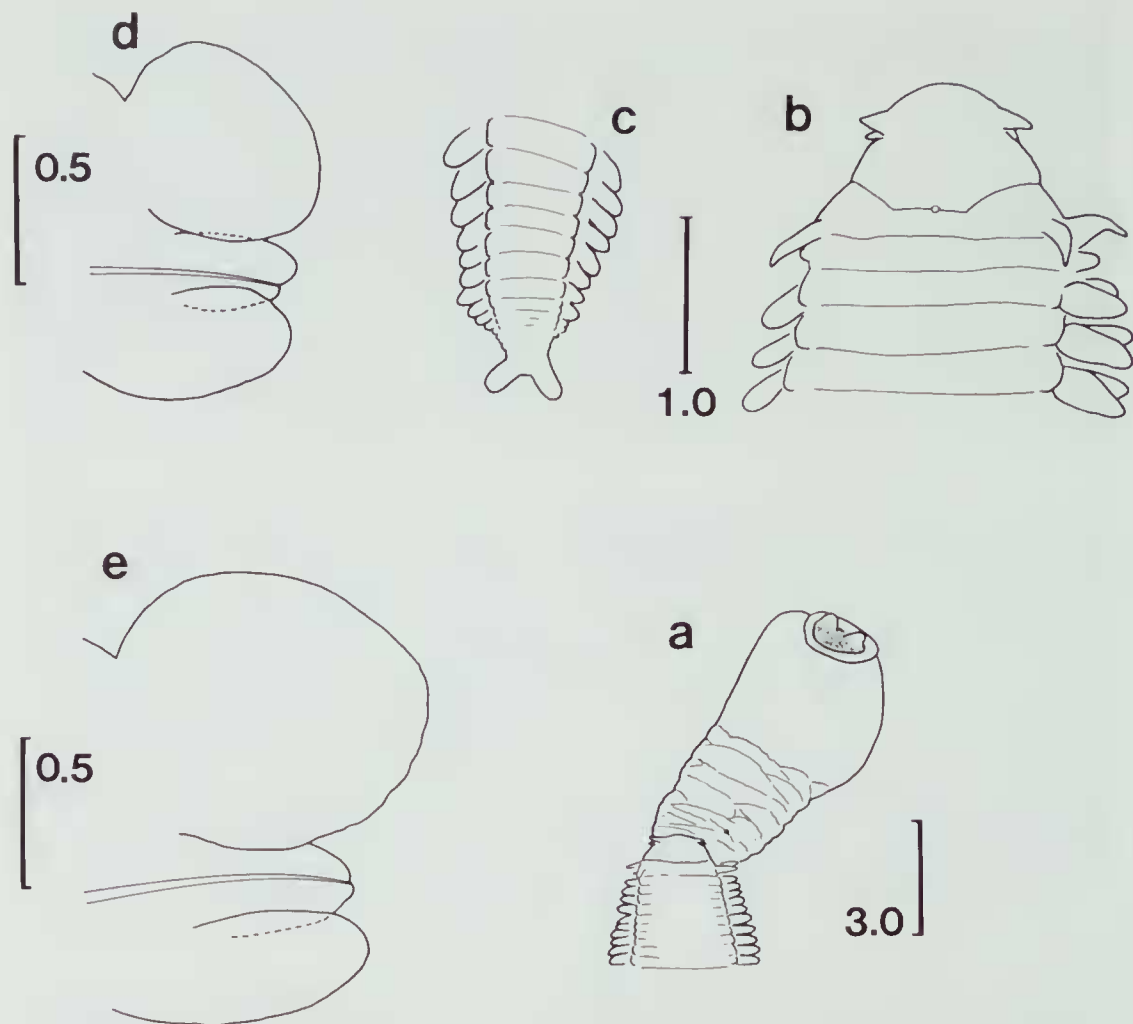


Figure 3. *Eteone flava* (*Eteone depressa* syntypes, SMNH 2413): a, everted proboscis dorsal view; b, prostomium dorsal view; c, anal cirri; d, setiger 10 parapodium posterior view; e, setiger 50 parapodium posterior view. Scale bars in mm.

brown, no markings. Prostomium two-thirds as long as wide; anterior margin rounded, two-thirds as wide as posterior margin. Eyes absent, median nuchal papilla located on posterior margin of prostomium (difficult to see in some syntypes). Antennae stout basally, with pointed tips, quarter as long as anterior width of prostomium (fig. 3b). Proboscis everted in 1 syntype, as long as anterior 26 segments, rugose and wrinkled on basal half, smooth distally; remaining syntypes with proboscis retracted, when dissected striated but smooth proximally, distally coarsely rugose with large tuberculae irregularly arranged. Orifice of proboscis directed obliquely dorsally and anteriorly, sur-

rounded by smooth fleshy ring and with pair of large papillae (1 on each side, in ventro-lateral positions) projecting from the opening (fig. 3a). Tentacular cirri located at posterior margin of first segment, equal in length and quarter as long as width of first segment. Second segment with setae, lanceolate neuropodia and ventral cirri, ventral cirri slightly longer than neuropodia throughout. Dorsal cirri present from segment 3, asymmetrical ovoid to circular, equal in diameter to length of neuropodia on anterior segments, becoming larger posteriorly so that from about segment 40 diameter of dorsal cirri is about 1.25 times length of neuropodia (figs 3d, e). Anal cirri laterally inserted, digiti-

form, 2–4 times as long as wide, slightly club-shaped in some syntypes (fig 3c). Setac with 2 large acutely pointed teeth slightly dissimilar in size and only 12–15 smaller teeth in 3 or 4 tiers (pl. 1c).

Remarks. The type material of *Eteone flava* is lost (K. Fauchald and F. Pleijel, pers. comm.), however there is general agreement among other authors that *E. depressa* is a junior synonym (Bergström, 1914; Hartmann-Schröder, 1971; Uschakov, 1974; Pleijel, in prep.). The above description agrees closely with previous descriptions of Bergström (1914) and Uschakov (1974) except that there is some variability in the proboscis. Bergström (1914) stated that the proboscis was smooth whereas Malmgren (1865) and Uschakov (1974) show that the proboscis is partly or wholly tuberculate. There is also some variability among the material examined here; tuberculae are more pronounced in dissected specimens in which the proboscis is retracted, and one of the syntypes of *E. lentigera* (which otherwise agree with the description above) has a fully everted proboscis which is smooth in the extreme basal region and distally but is wrinkled and tuberculate in a broad median section. It seems that the appearance of the proboscis depends in part on the degree of contraction of the specimen and the variability observed is probably not taxonomically significant.

Eteone sarsii Ørsted, 1843 (the type material of which is lost, K. Fauchald and F. Pleijel, pers. comm.), described from Sweden, was given as a junior synonym of *E. flava* by Hartman, 1959; on what basis or authority is not clear.

Eteone fucata M. Sars

Figures 4a, 14c

Eteone fucata Sars, 1872: 407. Norway.

Material examined. Norway, Christianafjord, Drobak, ZMO unregistered, syntype fragments, SEM stub NMV F53926 median parapodium.

Description. Sars' original material consists of 7 median fragments for a total of 228 segments, maximum width 1.5 (3.0) mm; both head/anterior segments and anal cirri are missing. Colour in alcohol pale yellow, no markings. Dorsal cirri asymmetrical ovoid, neuropodia triangular and ventral cirri ovoid-lanceolate, all of similar length (fig. 4a). Proportions of lobes similar over all segments but parapodia of presumed posterior segments smaller overall. Setae with pair of large teeth slightly dissimilar in size, otherwise smooth and without tiers

of small teeth at the articulation (fig. 14c).

Distribution. Christianafjord, Norway.

Remarks. Hartman (1959) and Hartmann-Schröder (1971) have suggested that *Eteone fucata* is possibly synonymous with *E. flava* (Fabricius, 1780), however the distinctly asymmetrical dorsal cirri differ from those figured herein for *E. flava*. The setac, which lack rows of small teeth, are also distinctive and appear to be unique for the genus. The original description of *E. fucata* by Sars (1872) states that the anal cirri are conical-acuminate and equal to four to five segments in length, further distinguishing *E. fucata* from *E. flava* and related species; if verified, this would require that *E. fucata* be transferred to the genus *Hypereteone* as defined in this paper. The proboscis is unknown but should be found to carry longitudinal ridges of tuberculate papillae if this is indeed a species of *Hypereteone*.

Eteone japonensis McIntosh

Figures 4b–d, 14d

Eteone japonensis McIntosh, 1901: 222. Japan Sea.

Material examined. Japan Sea, BMNH ZK 1921.5.1.1059, holotype, BMNH SEM stub segment 16 parapodium.

Description. Holotype an entire specimen, 133 segments, 26 mm long, 0.5(0.8) mm wide at segment 10. Colour in alcohol pale yellow-cream, no pigmentation. Prostomium 1.25 times as long as wide, anterior margin rounded, three-quarters as wide as posterior margin. Antennae threadlike, as long as anterior width of prostomium, and pair of large red eyes close to posterior margin of prostomium. Prostomium strongly dorso-ventrally flattened; nuchal papilla not visible (fig. 4c). First segment appears partly fused to prostomium, only faint division visible. Proboscis fully retracted, not previously dissected, extends back to segment 10, details unclear but without obvious tuberculae or papillae. Tentacular cirri equal in length to width of first segment, stout basally and tapering to very fine tip. Second segment with setac, ovoid neuropodia and ventral cirri smaller than those of subsequent segments. Dorsal cirri present from segment 3, ovoid lanceolate and similar in length to neuropodia anteriorly, slightly longer than neuropodia posterior to about segments 60–70. Neuropodia and ventral cirri ovoid lobes, ventral cirri slightly exceeding length of neuropodia throughout (fig. 4b). Anal cirri ovoid-digitiform with rounded tip, slightly wider at base and about twice as long as maximum width (fig. 4d). Setae few in number (6–8 per parapodium), with 2 large teeth slightly dissimi-

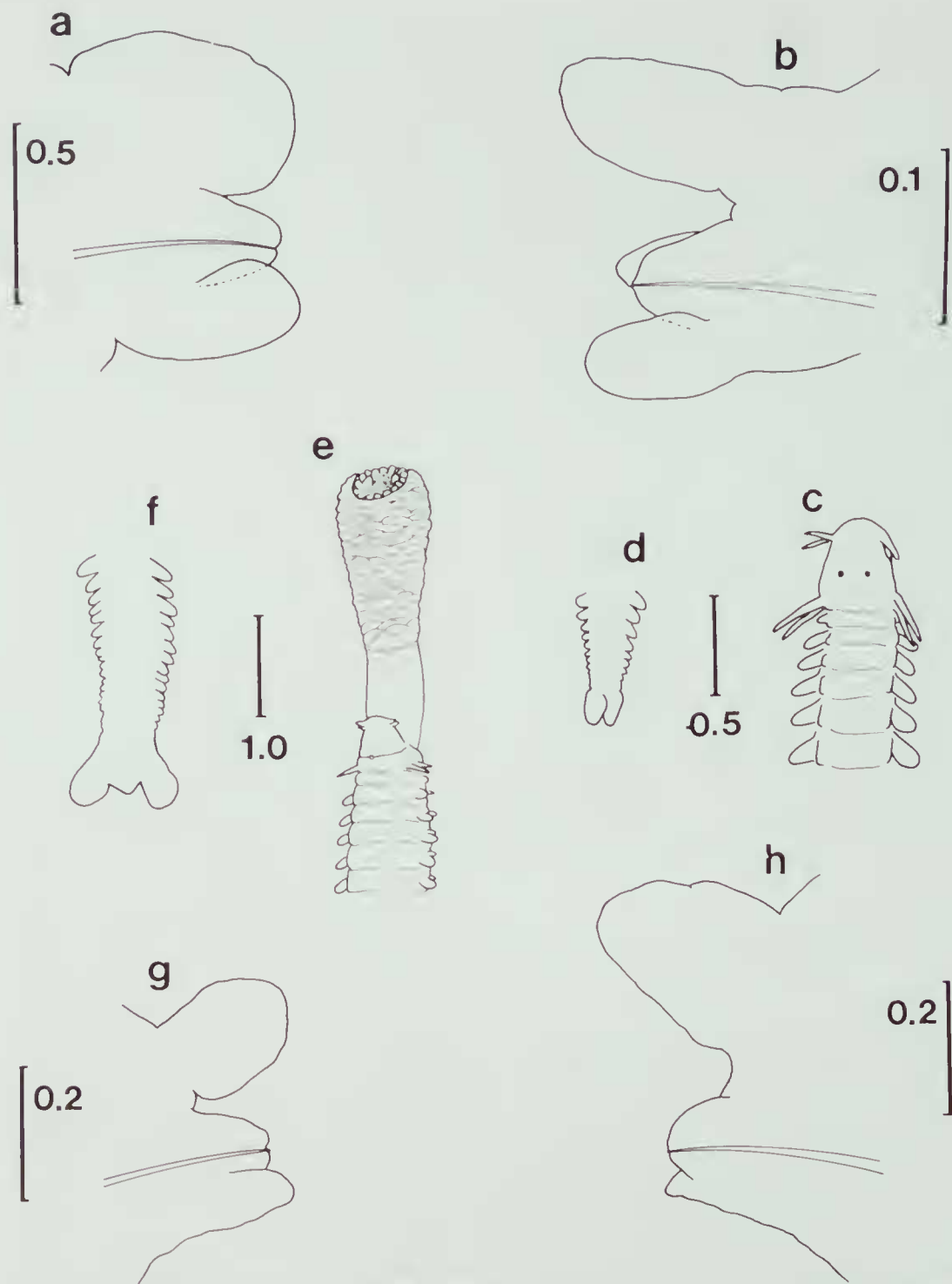


Figure 4. a, *Eteone fucata* ZMO syntype median parapodium anterior view. b-d, *Eteone japonensis* BMNH ZK1921.5.1.1059 holotype: b, setiger 15 parapodium anterior view; c, prostomium dorsal view; d, anal cirri. e-h, *Eteone longa* (*Eteone arctica* SMNH 2408 syntypes): e, prostomium and everted proboscis dorsal view; f, anal cirri; g, setiger 15 parapodium posterior view; h, setiger 100 parapodium anterior view. Scale bars in mm.

lar in size and apparently with only 1 tier of a few small teeth (fig. 14d).

Distribution. Known only from the Japan Sea.

Eteone limicola Verrill

Eteone limicola Verrill, 1873: 588. New Jersey.—Hartman, 1942: 42 (re-examination of type).

Material examined. USA, New Jersey, Beesleys Point, Great Egg Harbour, in sand, low water, Apr 1871, A.E. Verrill and S.I. Smith, YPM 36, syntype, SEM stub NMV F53927 about segment 26 RHS parapodium.

Description. The syntype (so labelled, but apparently the only type specimen in existence; Hartman, 1942), an anterior fragment of about 160 segments, 52 mm long, is in very poor condition having dried out and been returned to 70% ethanol some time prior to Hartman's (1942) examination of the specimen. The soft parts of the specimen are too shrunken and distorted to be described. Setae with 2 large teeth of similar size and at least 10 small teeth in 2 or 3 tiers (described from SEM photograph).

Remarks. Verrill's (1873) description includes the following information: colour in life light green throughout; prostomium as long as wide, with a slight constriction in advance of eyes, narrowing rapidly anteriorly; antennae about half as long as prostomium; tentacular cirri as long as prostomium; dorsal cirri and parapodial lobes small anteriorly, becoming much larger on posterior segments. Since Verrill makes no mention of the structure of the proboscis or the anal cirri, the placement of this species in *Eteone* is uncertain.

Distribution. Recorded only from Great Egg Harbour, New Jersey, USA.

Eteone longa (Fabricius)

Figures 4e–h, plate 1d

Nereis longa Fabricius, 1780: 300. West Greenland.

Eteone longa.—Uschakov, 1974: 166, 167, pl. 15 figs 8–10. Synonymy.—Kravitz and Jones, 1979: 9. Southward range extension to northern Oregon, USA.

Eteone arctica Malmgren, 1867: 148, 149, pl. 3 figs 12a–d. Spitsbergen.

Eteone islandica Malmgren, 1867: 148, pl. 4 figs a–d. Iceland.

Eteone leuckarti Malmgren, 1867: 149, pl. 3 figs 15a–d. Iceland.

Eteone lilljeborgi Malmgren, 1867: 148, pl. 4 figs 22a–d. Sweden.

Eteone robusta Verrill, 1873: 588. Rhode Island and Massachusetts (fide Pettibone, 1963: 73).

Material examined. Svalbard (Spitsbergen). Safehavn,

10–30 fm [18–55 m], A.J. Malmgren, SMNH 2408, 9 syntypes of *E. arctica* and SMNH SEM stub segment 11 RHS parapodium; Treuerenbb., 20 fm [37 m], Spetzbergen Expedition 1861, SMNH 2409, 11 syntypes of *E. arctica*.

Iceland. Raufarhavn, 30 fm [55 m], SMNH 2406, 3 syntype fragments of *E. islandica*; Berufjord, 25 fm [46 m], O. Torell, SMNH 2407, 1 syntype of *E. islandica*; Thistlefjord, 10–16 fm [18–29 m], O. Torell, SMNH 2410, 3 syntypes of *E. leuckarti*; Jutefjord? [label unclear], 10–16 fm [18–29 m], O. Torell, SMNH 2411, 1 syntype of *E. leuckarti*. Bohuslan ("Bahusia" in Malmgren, 1867): S. Loven, SMNH 2405, 2 syntypes of *E. lilljeborgi*.

USA, USNM 26964, 3 type slides labelled anterior, middle, and last feet, *E. cinerea*.

Description. (based on syntypes of *E. arctica*) Size range 87 segments, 18 mm long, 0.7 (1.1) mm wide to 134 segments, 75 mm long, 1.0 (1.5) mm wide (entire specimens). Colour in alcohol pale yellow. Prostomium three-quarters as long as wide, a truncate triangle with rounded anterior margin half as wide as posterior margin. Antennae third to half as long as width of anterior margin of prostomium. No eyes visible. A prominent nuchal papilla on posterior margin of prostomium (fig. 4e). Fully everted proboscis (on 5 syntypes) up to 3 mm long, equal to anterior 15 segments, consists of smooth tube over the basal half, coarsely tuberculate over the distal half. Proboscis terminating in ring of 15 globular papillae surrounding the orifice with additional pair of papillae (1 on each side) projecting from orifice (fig. 4e). Tentacular cirri equal in length and about third as long as width of first segment. Second segment with setae, rounded neuropodia and digitiform ventral cirri extending beyond the tip of neuropodia. Neuropodia shorter than ventral cirri anteriorly, ventral cirri reducing in size so that neuropodia and ventral cirri of equal length by about segment 30, ventral cirri present as small lobe attached to ventral margin of neuropodia on subsequent segments. Dorsal cirri present from segment 2, quadrangular with rounded tip and as long as ventral cirri over anterior 10–20 segments, dorsal cirri exceeding ventral cirri in length from about segment 30 and posteriorly, reaching maximum length and becoming ovoid lanceolate in shape over segments 40–50, tending to triangular and reducing in size over posterior segments (figs 4g, h). Anal cirri globular to digitiform lobes up to twice as long as wide (fig. 4f). Setae with 2 large teeth equal or only slightly dissimilar in size and many quite small teeth in about 4 tiers (pl. 1d).

Remarks. Two specimens among the syntypes of *E. arctica* (SMNH 2409) have large circular dorsal cirri and dissected probosces in poor condition and

may not be conspecific with the remaining syntypes. The syntypes of *E. islandica* and *E. lilljeborgi* agree closely with *E. arctica* in the form of the prostomium, tentacular cirri, proboscis and anal cirri and the synonymies proposed by Bergström (1914) and Hartman (1959) are accepted here. The syntypes of *E. leuckarti* differ only in that the anal cirri are more elongate (up to 5 times as long as wide) than in *E. arctica*; this synonymy is also confirmed.

The holotype of *Eteone robusta* is a gravid female and also agrees closely with the above description of *E. arctica*. Hartman's (1942) redescription of this specimen states that the proboscis is smooth, however the dissection that had been performed on the specimen was incomplete and revealed only part of the digestive tract posterior to the proboscis; further anterior dissection showed that the proboscis proper is coarsely rugose throughout and terminates in a ring of 15 papillae with an additional pair of lateral papillae immediately posterior to the terminal ring of papillae.

Eteone emerea Webster and Benedict, 1884 was synonymised with *E. longa* by Pettibone (1963); the parapodia of *E. emerea* examined here (type slides, USNM 26964) are similar to those of *E. longa* however I am not sufficiently confident to make this synonymy based on such limited material. *Eteone villosa* Levisen, 1882, was listed as a junior synonym of *E. longa* by Hartman (1959) but without citing any authority.

Distribution. Arctic-boreal; widely reported from North Pacific and Atlantic Oceans.

Eteone pacifica Hartman

Eteone pacifica Hartman, 1936b: 31, Washington. New name for *Eteone maculata* Treadwell, 1922: 174 (preoccupied); not Ørsted, 1843. — Hartman, 1936a: figs 47, 48. — Banse, 1972: 191–193, fig 1a–l (redescription).

Remarks. The following information is taken from the redescription of the holotype by Banse (1972). Prostomium about as long as wide, posterior margin only slightly wider than anterior margin. Antennae short, small nuchal papilla present. Tentacular cirri short and equal in length (on one side; unequal but apparently regenerating on the other side). Second segment with neuropodia, setae and ventral cirri. Dorsal cirri from segment 3, ear-shaped and strongly asymmetrical except on anterior-most parapodia, carried on distinct cirrophore on most median and posterior segments. Ventral cirri and neuropodia ovoid and roughly as long as dorsal cirri throughout. Setae with two unequal

large teeth and several smaller teeth. Anal cirri not described. The proboscis had been removed from the holotype when examined by Banse and had not been described by Treadwell (1922) or Hartman (1936a, 1936b), hence the placement of this species in *Eteone* is uncertain.

Distribution. Known from the type locality, Friday Harbour, Washington State; also recorded by Hartman (1936b) from Moss Beach, San Mateo County, California, west coast USA.

Eteone parali sp. nov.

Figures 5a–e, plates 1c, f

Material examined. Holotype: Australia, Queensland, Bramble Bay, Moreton Bay, Stns 21 and 32, approximately 5 m, mud, van Veen Grab, Sep 1972, coll. S. Cook, QM GH3577 (for further locality details see Stephenson et al., 1976). 2 SEM stubs NMV F53928, F53929 segment 21 LHS and segment 26 RHS parapodia.

Paratypes: Data as for holotype, QM GH4107, 1 paratype; Bramble Bay, Moreton Bay, Stn 3B, Jun 1975, coll. S. Cook, QM GH3633, 1 paratype; Middle Banks, northern Moreton Bay, Stn 4B, van Veen Grab, Jun 1975, coll. S. Cook, QM GH3639, 1 paratype; Middle Banks, northern Moreton Bay, Stn 6E, van Veen Grab, Jun 1975, coll. S. Cook, QM GH3654, 1 paratype.

Description. Holotype an anterior fragment with proboscis everted, 159 segments, 88 mm long, 1.6 (3.2) mm wide. Size range of entire paratypes: 106 segments, 12 mm long, 0.6 (0.8) mm wide to 231 segments, 95 mm long, 1.6 (3.3) mm wide. Body pale brown throughout, with single darker brown transverse band across the dorsum of each segment (dorsal bands slightly faded in holotype but very distinct in several paratypes). Prostomium almost semi-circular in shape, about two-thirds as long as wide, anterior margin rounded and projecting beyond antennae, width between antennae about two-thirds width at posterior margin. One pair of small dark eyes on posterior quarter of prostomium. Nuchal papilla absent (figs 5a, b). Dorsal pair of antennae approximately half as long as anterior width of prostomium, ventral pair (partly obscured in dorsal view) slightly shorter. Proboscis fully everted in holotype (fully retracted in all paratypes), as long as anterior 12 segments and divided into 2 distinct regions: proximal half about as wide as anterior body segments, slightly rugose dorsally and smooth but with faint longitudinal striations ventrally. Distal region of proboscis considerably expanded (to almost twice width of proximal region), more coarsely rugose dorsally and with longitudinal striations still visibly ventrally. Buccal opening directed upward, with 2 large conical papillae projecting from ventral region of the orifice.

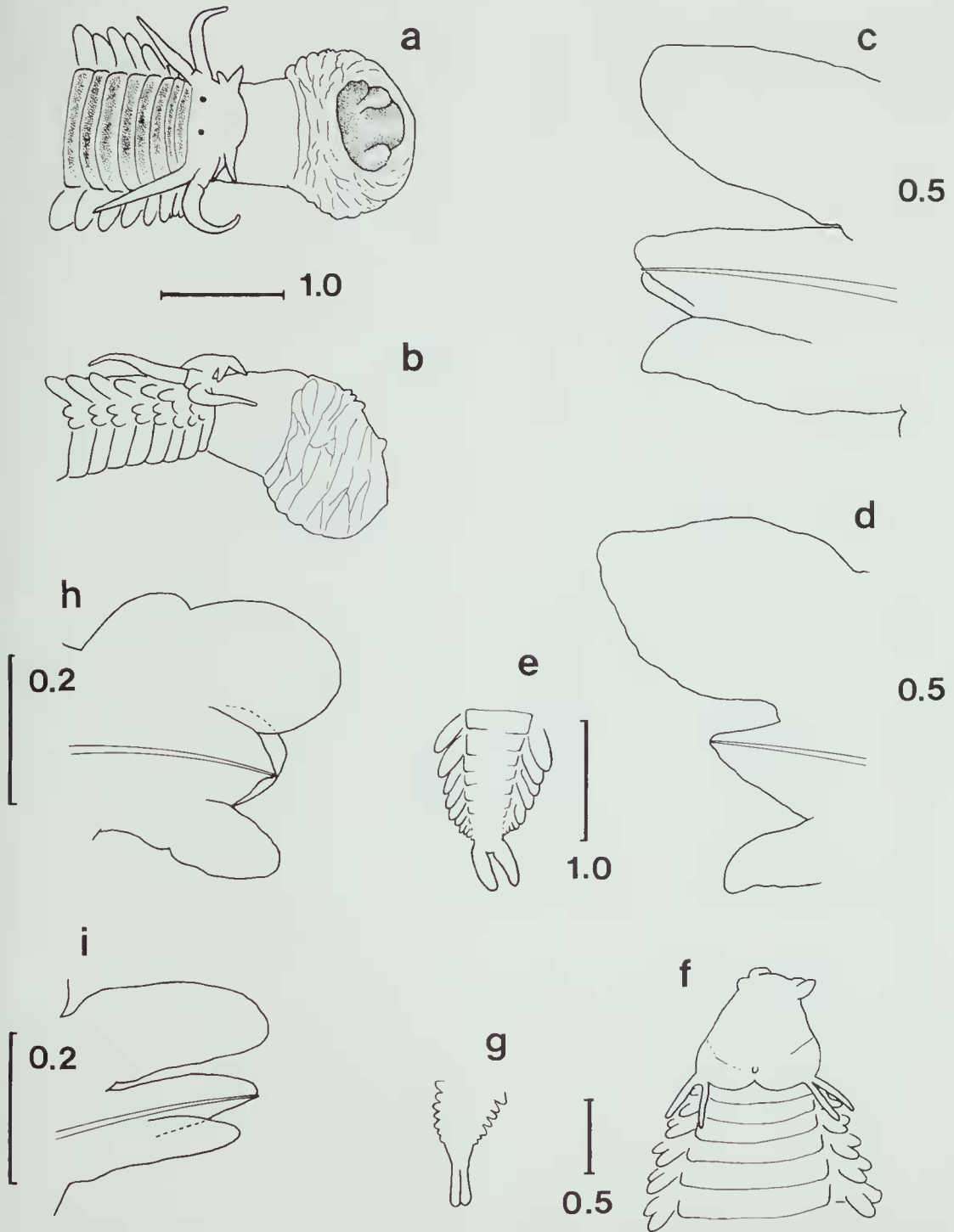


Figure 5. a-d, *Eteone palari* QM GH3577 holotype: a, prostomium and everted proboscis dorsal view; b, prostomium and everted proboscis lateral view; c, setiger 20 parapodium anterior view; d, setiger 50 parapodium anterior view. e, *Eteone palari* QM GH4107 paratype anal cirri. f-i, *Eteone robertianae* BMNH ZK1921.5.1.1044 holotype: f, prostomium dorsal view; g, anal cirri; h, setiger 15 parapodium posterior view; i, setiger 92 parapodium posterior view. Scale bars in mm.

Several smaller inconspicuous papillae line the dorsal rim of orifice (figs 5a, b). Form of proboscis apparently similar in dissected paratypes though structures less clear. Dorsal pair of tentacular cirri about as long as width of first segment, ventral pair about two-thirds as long. Second segment with setae, small lanceolate neuropodia and ventral cirri of similar size and shape. Dorsal cirri present from segment 3, initially lanceolate, becoming elongate-ovoid by segment 15. Neuropodia and ventral cirri lanceolate acuminate and of similar proportions throughout. All parapodial lobes similar and increasing in size over anterior 15-20 segments, dorsal cirri becoming further expanded and relatively longer than the other lobes posterior to segment 20, reaching maximum of twice length of other parapodial lobes by segment 50, thereafter of similar proportions on all posterior segments (figs 5c, d). Anal cirri missing from the holotype; paratypes with digitiform anal cirri, about 4 times as long as wide (fig. 5e). Setae with single large tooth and 2 or 3 tiers of smaller teeth (pl. 1e, f).

Remarks. *Eteone palari* differs from most species of *Eteone* by having the dorsal tentacular cirri longer than the ventral and the maximum width of the prostomium exceeding its length. Only *E. filiformis* and *E. trilineata* share these characteristics but can be distinguished as follows: *E. filiformis* has a narrow threadlike body and prostomium fused with the first segment, readily distinguishing it from *E. palari*. *Eteone trilineata* is similar to *E. palari* but has a ring of large globular papillae surrounding the buccal opening (*E. palari* has only 2 large papillae and several small indistinct papillae at the buccal opening). *Eteone palari* is also distinguished from these and all other species of *Eteone* by the unique setae which have only a single large tooth.

Etymology. The specific name *palari* is derived from an Australian Aboriginal word meaning different and is to be treated as indeclinable.

Distribution. Recorded only from Moreton Bay, Queensland, Australia, shallow muddy sediments.

Eteone robertianae (McIntosh)

Figures 5f-i

Uconella Robertianae McIntosh, 1874: 197. Scotland.

Eteone arctica var. *robertiana* McIntosh, 1908: 103, 104, pl. 69 figs 8 and 9.

Material examined. Scotland, St Andrews, BMNH ZK 1921 5.1 1044, holotype and BMNH SEM stubs segments 16 and 93 RHS parapodia

Description. Holotype a single entire specimen in 2 fragments for total of 126 segments, 35 mm long, 1.2(1.7) mm wide at segment 10. Colour in alcohol yellow white, no pigment patterns. Prostomium almost completely fused with first segment, only faint division visible; together as long as maximum width, width of anterior margin about third maximum width. Antennae stout, shorter than anterior width of prostomium, ventrally directed and not clearly visible from above. No eyes visible. A small distinct nuchal papilla present on mid-dorsal posterior margin of prostomium (fig. 5f). Proboscis (not previously dissected) extends back to segment 12 in retracted position, uniformly rugose with longitudinal folds in retracted position but without thick ridges. Buccal opening with terminal ring of 11 or 12 globular papillae and pair of large lateral papillae. Tentacular cirri threadlike, each about half as long as width of first segment. First and second segments strongly constricted. Second segment with setae, vestigial neuropodia and narrow, elongate ventral cirri about half as long as ventral cirri of subsequent segments. Dorsal cirri present from segment 3, narrow ovoid with rounded tips, as long as neuropodial lobes on anterior segments; slightly broader, asymmetrical and slightly exceeding length of neuropodia to segment 40-50. Dorsal cirri narrower but of similar relative length posteriorly. Neuropodial lobes prominent from segment 2, with blunt rounded tips, narrower on posterior segments. Ventral cirri narrow, elongate, exceeding length of neuropodia on anterior 10-15 segments, thereafter as long as neuropodia on median segments and reducing to small lobe shorter than neuropodia posterior to about segment 70 (figs 5h, i). Anal cirri digitiform with rounded tips, 3 or 4 times as long as wide (fig. 5g). Setae with 2 unequal large teeth and apparently many small teeth (SEM preparations proved unsatisfactory).

Remarks. McIntosh (1908) subsequently reduced *Eteone robertianae* to the status of a variety of *E. arctica* (treated here as a junior synonym of *E. longa*), however the narrower dorsal cirri and longer anal cirri distinguish *E. robertianae* from the latter species. McIntosh (1908) also noted that two nuchal papillae were visible; I can see only one on the holotype. In addition, *Eteone robertianae* differs from all species of *Eteone* in having the first and second segments strongly constricted (this observation was confirmed by McIntosh's (1908) examination of additional material).

Eteone robertianae has longitudinal folds of the proboscis in the retracted position resembling the longitudinal ridges otherwise found only in species

of *Hypereteone*. This however appears to be an artefact of retraction; the folds are hollow, not thick and tuberculate and I would expect the proboscis to have a uniform rugose appearance without longitudinal ridges if specimens were preserved with this structure fully everted. In any case, the digitiform anal cirri clearly place this species in the genus *Eteone*, not *Hypereteone*.

Distribution. Recorded only from St Andrews, Scotland.

Eteone sculpta Ehlers

Figures 6a–c, 14c

Eteone sculpta Ehlers, 1897: 33–35, pl. 1 figs 26–33. South Georgia. — Augener, 1932: 26. South Georgia.

Eteone rubella Ehlers, 1900: 211. Santa Cruz, Patagonia (fide Augener, 1932).

Material examined. South Georgia, v.d. Steinen, HZM V-1205, labelled "original", *E. sculpta* holotype, SI-M stub NMV F53930 segment 28 RHS parapodium.

Description. Holotype an entire specimen of 67 segments, 16 mm long, 1.5 (2.2) mm wide. Prostomium semi-circular, without dorsal groove or any obvious markings. Antennae inserted in notches at anterior margin of prostomium. Prostomium third to half as long as wide, width at anterior margin two-thirds that at posterior margin. No eyes visible. A distinct mid-dorsal depression present at posterior margin of prostomium but no nuchal papilla visible (fig. 6a). Proboscis (which had already been removed from holotype but not previously dissected to reveal structure) smooth, with pair of large lateral papillae and ring of smaller papillae at buccal opening. Tentacular cirri short and similar in length, only slightly longer than antennae. Second segment with setae, neuropodia and ovoid ventral cirri twice as long as neuropodium. Dorsal cirri present from segment 3, almost circular in shape except for region of attachment. Dorsal cirri equal in size to ventral cirri on anterior 10 segments, becoming relatively larger on median segments so that dorsal cirri are twice as long as neuropodia over segments 20–50; all parapodial lobes becoming reduced and similar in size on posterior-most segments. Neuropodia and ventral cirri equal in size from segment 3, neuropodia triangular with rounded tip, ventral cirri acunilate-lanceolate (fig. 6c). Anal cirri spherical globes 0.25 mm in diameter (fig. 6b). Setae with pair of large teeth of equal size and 3 or 4 tiers of small teeth (fig. 14c).

Remarks. Ehlers' (1897) description was based on a single specimen which agrees with that described

above in all respects except number of segments (66 as against 74 counted by Ehlers); I presume this to be a minor error on Ehlers' part and regard this specimen as the holotype.

Eteone crassifolia Ehlers, 1900, (from Puerto Harris, Strait of Magellan), and *Eteone reyi* Gravier, 1906, (from Antarctic seas) were listed as junior synonyms of *E. sculpta* by Hartman (1959) but without citing any authority.

Distribution. Recorded from South Georgia and Patagonia, southern Atlantic.

Eteone spetsbergensis Malmgren

Figures 6d–g, plate 2a

Eteone spetsbergensis Malmgren, 1865: 102, pl. 15 figs 38a–c. Spitsbergen. — Hartman, 1948: 20, fig. 5b. Bering Sea, Alaska.

Eteone spetsbergensis spetsbergensis. — Uschakov, 1974: 168. (synonymy).

Eteone spetsbergensis bistriata Uschakov, 1953: 208, 209, fig. 2. — Uschakov, 1974: 168, 169, pl. 17 figs 1–5. (synonymy).

Material examined. Svalbard (Spitsbergen), Shoal Point, 25–30 fm [46–55 m], A.S. Malmgren, SMNH 2412, 11 syntypes of *E. spetsbergensis*, SMNH SEM stub segment 11 RHS parapodium.

Description. The syntype series consists of 11 specimens and 2 median fragments, size range 85 segments, 38 mm long, 1.5 (2.0) mm wide (anterior fragment) to 166 segments, 78 mm long, 1.5 (2.0) mm wide (entire specimen). Colour in alcohol pale yellow, several specimens in poor condition. Prostomium as long as wide, truncate triangle with rounded anterior margin half as wide as posterior margin. Antennae half as long as width of anterior margin of prostomium. One pair of faint eyes visible in only 1 syntype. Nuchal papilla absent (fig. 6d). Proboscis fully everted in 1 syntype, 3 mm long and as long as 13 anterior segments, consisting of faintly tuberculate tube, widest at extremity, not divided into distinct regions. Buccal opening a fleshy ring without ring of papillae but with single pair of lateral papillae projecting from interior of orifice (fig. 6d). Tentacular cirri almost half as long as width of first segment, equal in length but ventral pair significantly stouter. Second segment with setae, asymmetrical kidney-shaped ventral cirri and strongly reduced neuropodia (setae of second segment few or occasionally absent in syntypes). Dorsal cirri present from segment 3, asymmetrical circular-ovoid over anterior segments, becoming more circular and symmetrical from about segments 40–50. Ventral cirri irregularly kidney-shaped, similar in length to dorsal cirri anteriorly,

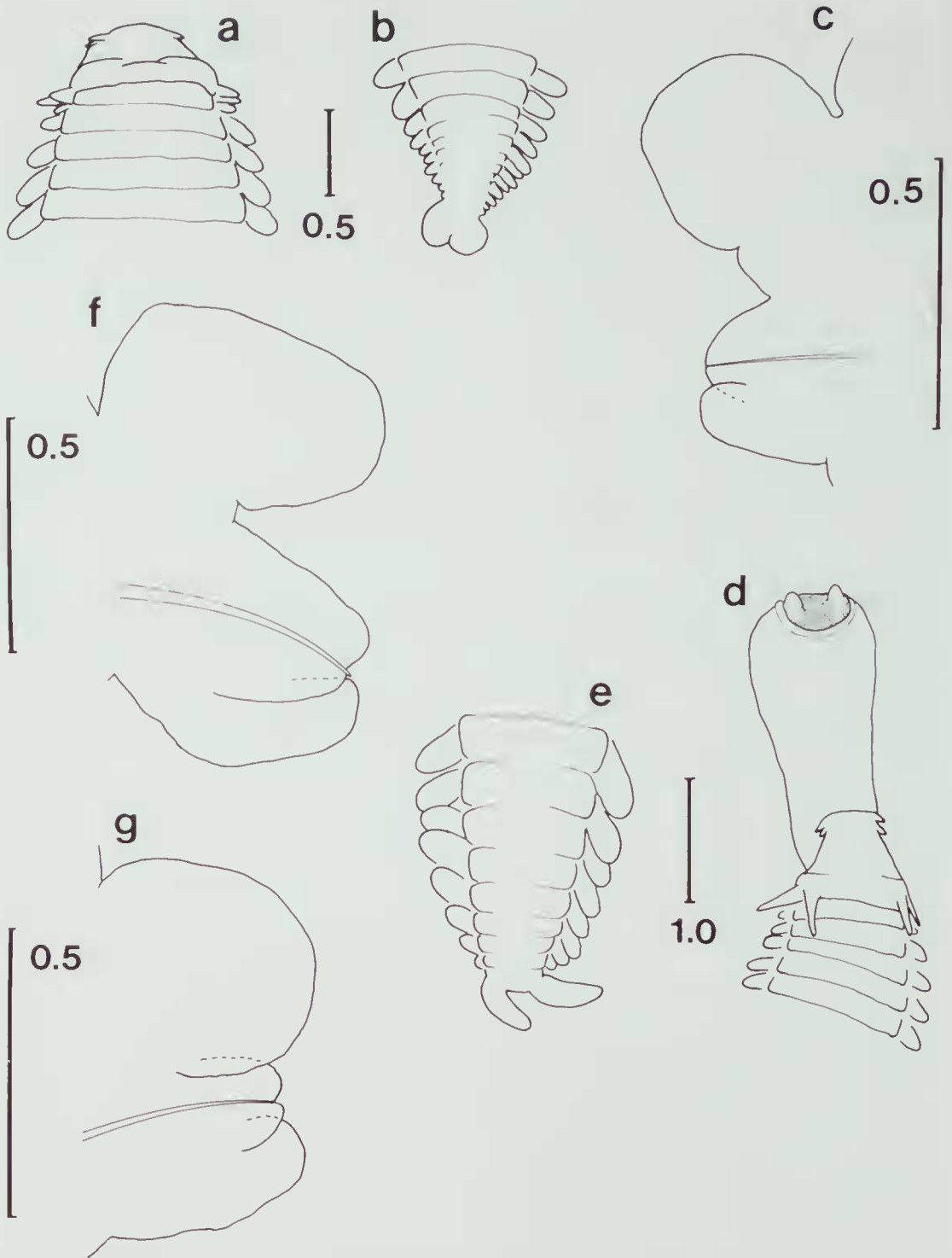


Figure 6. a-c, *Eteone sculpta* HZM V-1205 holotype: a, prostomium dorsal view; b, anal cirri; c, setiger 30 parapodium anterior view. d-g, *Eteone spetsbergensis* SMNH 2412 syntype: d, prostomium and everted proboscis dorsal view; e, anal cirri; f, setiger 20 parapodium posterior view; g, setiger 140 parapodium posterior view. Scale bars in mm.



a



b



c



d

Plate 2. Scanning electron micrographs of setae of species of *Eteone* and *Hypereteone*. a, *E. spetsbergensis* SMNH 2412 syntype (from setiger 10); b, *E. tulua* QM GH3617 holotype (from setiger 10); c, *H. fauchaldi* USNM 579551 paratype (from setiger 10); d, *H. foliosa* MNHN unregistered, from Tatihou, near type locality (from setiger 190). Scale bars in μm .

dorsal cirri increasing further in size and exceeding length of ventral cirri from about segments 40–50. Lanceolate neuropodia as long as ventral cirri over most segments but shorter than ventral cirri over anterior-most 10 and posterior-most 20 segments (figs 6f, g). Anal cirri digitiform with narrow point of attachment, 3 times as long as wide (fig. 6e). Setae with 2 very dissimilar teeth and many smaller teeth in 4 or 5 tiers (pl. 2a).

Remarks. *Eteone spetsbergensis* is similar to *Eteone flava* but is distinguished by the strongly asymmetrical ear-shaped dorsal cirri in anterior segments, the longer anal cirri, and the setae with two unequal teeth. *Eteone andreapolis* McIntosh, 1874 (from St Andrews, Scotland) and *E. picta* Ehlers, 1873 (junior homonym, not Quatrefages, 1865) were listed by Hartman (1959) as junior synonyms

of *E. spetsbergensis*. Uschakov (1974) recognised two subspecies based on differences in colouration.

Distribution. North Atlantic (north from Scotland) and Arctic Oceans (after Uschakov, 1974).

Eteone spilotus Kravitz and Jones

Figures 7a-d, 14f

Eteone spilotus Kravitz and Jones, 1979: 9, 10, figs 3a-c. Columbia River, west coast USA.

Material examined. USA, northern Oregon/southern Washington, off Columbia River, 46°14.0'N, 124°10.75'W, Sin 88A grab 5, 7 Dec 1974, 44 m, A. Carey, USNM 57959, 2 paratypes, SEM stub NMV F53931 segment 11 parapodium from larger of 2 paratypes.

Description. Size range of paratypes examined: 88

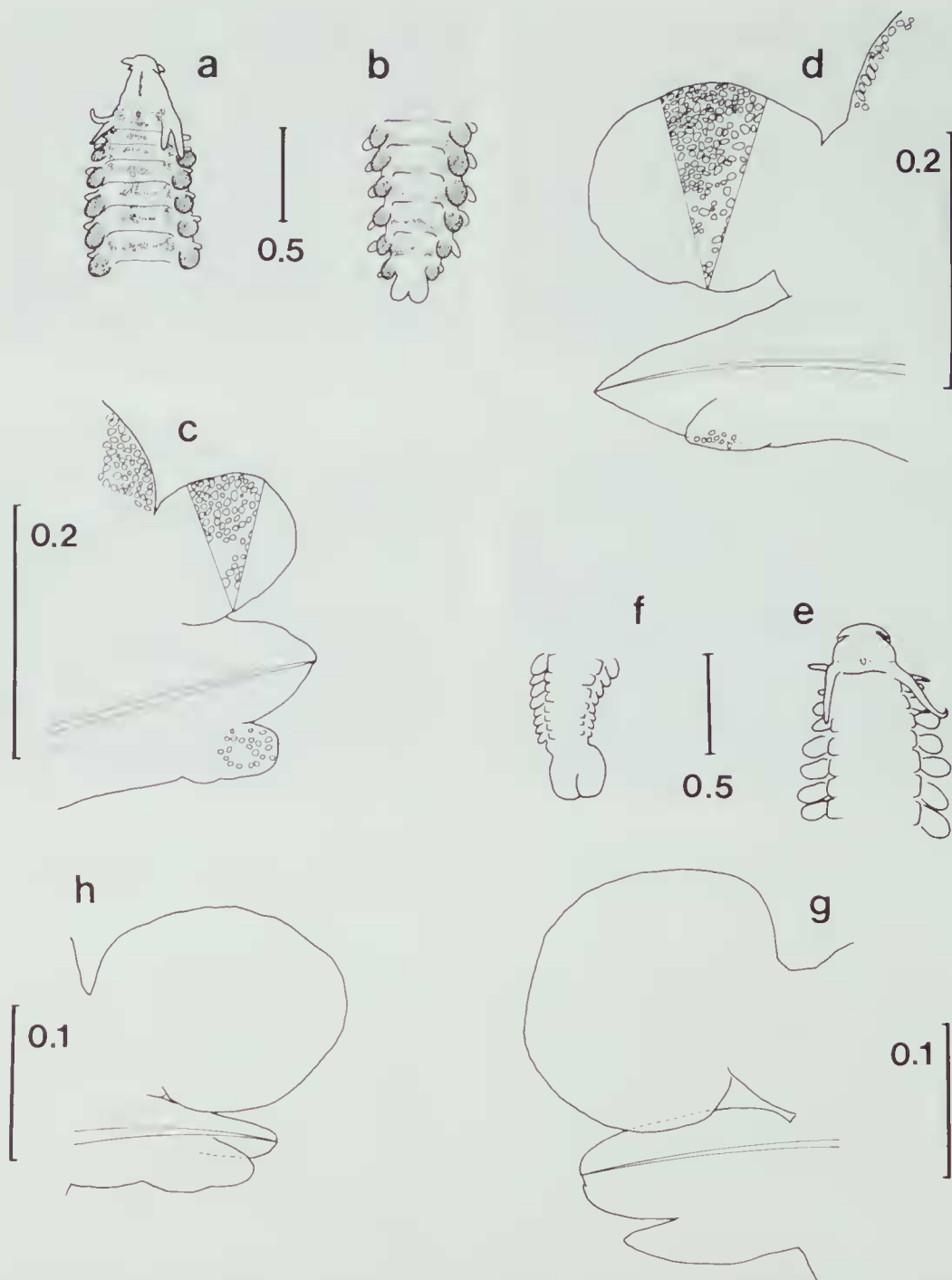


Figure 7. a-d, *Eteone spilotus* USNM 57959 larger of 2 paratypes: a, prostomium, dorsal view; b, anal cirri; c, setiger 10 parapodium posterior view; d, setiger 50 parapodium anterior view (stippling indicates areas of dark brown pigmentation; detail shows dark brown pigmented cells in dorsal cirri). e-h, *Eteone trilineata* USNM 441 largest of 3 syntypes: e, prostomium dorsal view; f, anal cirri; g, setiger 11 parapodium anterior view; h, setiger 50 parapodium posterior view. Scale bars in mm.

segments, 13 mm long, 0.4 (0.6) mm wide; 122 segments, 18 mm long, 0.5 (0.7) mm wide (entire worms). Colour in alcohol pale yellow with conspicuous dark brown pigmentation: prostomium with median longitudinal lines dorsally and ventrally and lateral patch on each side, dorsal and anal cirri heavily pigmented, ventral cirri sparsely pigmented and each segment with heavily pigmented transverse band dorsally and ventrally and patch at base of each dorsal cirrus (fig. 7a). Prostomium about as long as maximum width at posterior margin, width at anterior margin half width at posterior margin. Anterior margin rounded, with blunt antennae each third-half as long as anterior width of prostomium. One pair of dark red subdermal eyes near posterior margin of prostomium. Prostomium with median dorsal groove and nuchal papilla on the posterior margin (fig. 7a). Proboscis, examined through ventral dissection in larger of 2 paratypes, extends back to segment 6, folded internally to produce about 4 hollow longitudinal ridges, otherwise smooth. Buccal opening with 2 large lateral papillae and uncertain number of smaller papillae in a ring. Tentacular cirri third as long as width of first segment. Second segment with setae, rounded digitiform neuropodia and ventral cirri of similar length. Dorsal cirri present from segment 3, quadrangular with rounded corners over first 10 segments, becoming more rounded and narrower at base thereafter. Neuropodia becoming narrower and acuminate and ventral cirri reduced to small digitiform process from segments 40–50 (figs 7c, d). No significant change to proportions of subsequent segments. Anal cirri 3 times as long as wide and equal to posterior-most 2 segments in length (fig. 7b). Setae with 2 pairs of similarly-sized large teeth and many small teeth in 2 or 3 tiers (fig. 14f).

Remarks. Kravitz and Jones (1979) reported that the everted proboscis is smooth; the hollow internal folds noted above are most probably an artefact of retraction and are not comparable with the thick tuberculate or rugose ridges seen in species of *Hypereteone*. With the aid of SEM, the setae are seen to have two teeth of equal or nearly equal size on each side of the blade, further distinguishing *Eteone spilotus* from *E. californica* and similar species.

Distribution. Northern Oregon and southern Washington, west coast of USA.

Eteone suecica Bergström

Eteone suecica Bergström, 1914: 199–201, figs 75a–e. West coast of Sweden.

Remarks. Bergström's type material is apparently lost (F. Pleijel, pers. comm.). The following is abstracted from Pleijel (in prep.): Prostomium broader than long, ventral pair of antennae longer than dorsal pair. One pair of eyes and nuchal papilla present but indistinct in preserved specimens. Proboscis finely rugose proximally, distally smooth, the 2 regions separated by furrow; without terminal ring of papillae but with pair of large lateral papillae inside orifice. Tentacular cirri about as long as width of first segment, ventral pair stouter. Dorsal cirri rounded, situated on prominent cirrophores. Ventral cirri with acutely pointed tips, longer than neuropodial lobes. Anal cirri as long as broad. Setae with pair of large teeth of equal size and few small teeth.

Distribution. Known only from north-east England and Sweden (Pleijel, in prep.).

Eteone tetraophthalma Schmarda

Eteone tetraophthalma Schmarda, 1861: 85, figs a–d. Atlantic Ocean.

Remarks. The location of Schmarda's type material is unknown. *Eteone tetraophthalma* is poorly known; Schmarda's description includes the following information: 4 eyes, anterior pair closer together and larger than posterior pair; 2 pairs of tentacular cirri of unequal length; dorsal cirri lanceolate, longer than neuropodial lobes; anal cirri lanceolate. No other species of *Eteone* is known to possess four eyes. Schmarda's description of lanceolate anal cirri and tentacular cirri of unequal length indicates that *E. tetraophthalma* may be a species of *Hypereteone*, but there is insufficient information to make a new combination and this species is provisionally retained in *Eteone*.

Distribution. Recorded by Schmarda from the Atlantic Ocean.

Eteone trilineata Webster and Benedict

Figures 7e–h, 14g

Eteone trilineata Webster and Benedict, 1887: 712, pl. 1 figs 5–8, pl. 2 fig. 9. Maine. — Pettibone, 1963: 71–72, fig. 16g.

Material examined. USA, Maine, Eastport, coll. H.E. Webster, no date, USNM 441, 3 syntypes, SEM stub NMV F53932 segment 12 RHS parapodium from largest of 3 syntypes.

Description. Size range of syntypes 62 segments, 4 mm long, 0.3 (0.5) mm wide to 76 segments, 8 mm long, 0.4(0.6) mm wide (all entire specimens). Prostomium 1.3 times wider than long, lateral margins convex and bulbous, narrow only in extreme

anterior region which is separated by distinct constriction. Anterior margin half width of posterior margin. Antennae about half as long as anterior width of prostomium (fig. 7e). Eyes not visible (a single pair of large black eyes situated close to posterior margin of prostomium was figured by Webster and Benedict; these have apparently faded since). Prostomium opaque and colourless but with 4 distinct transparent regions: 1 in median anterior region and another immediately posterior to the first, and pair posteriorly on lateral margins. Prostomium with median nuchal papilla on posterior margin. Proboscis, examined through ventral incision on largest syntype, extends back to segment 13, details unclear in dissection but appears slightly rugose basally with large irregular papillae in indistinct dorsolateral region distally, with ring of 10 or more papillae at buccal opening. Ventral pair of tentacular cirri as long as width of first segment, dorsal pair twice as long and with very fine tip section (third of total length of cirrus). Second segment with setae, lanceolate neuropodia and similar but slightly longer ventral cirri. Neuropodia and ventral cirri similar in size from segment 10 and of similar proportions throughout. Dorsal cirri present from segment 3, circular, anteriorly similar in size to neuropodia but from segments 8-10 exceeding length of other parapodial lobes and present as large lamellar lobe attached to distinct basal stalk throughout all posterior segments (figs 7g, h). Anal cirri stout, digitiform, about 3 times as long as wide and as long as last 3 or 4 segments (fig. 7f). Setae with pair of large teeth of similar size and about 8-10 small teeth in 2 tiers (fig. 14g).

Distribution. Recorded from Gulf of St Lawrence to Massachusetts, east coast USA (Petibone, 1963).

Eteone tuberculata Treadwell

Eteone tuberculata Treadwell, 1922: 174. Washington. — Banse, 1972: 193, 194, fig. 1g-1 (redescription).

Remarks. The following is taken from the original description of Treadwell (1922) and from Banse's (1972) redescription of the holotype. Prostomium about as long as wide with narrow rounded anterior margin. Prostomium forming median dorsal indentation into first segment carrying distinct nuchal tubercle. Tentacular cirri equal in length. Proboscis apparently absent and unknown. Right parapodium of second segment removed by Treadwell and described with setae and an aciculum; left parapodium of second segment remains and was described by Banse as lacking

setae and with reduced neuropodium. Dorsal cirri symmetrical, conical-lanceolate, becoming narrower on posterior segments, roughly as long as neuropodial lobes throughout. Ventral cirri lanceolate, as long as neuropodia anteriorly, shorter posteriorly. Anal cirri described as "short, stout" by Treadwell, and "conical" by Banse. Setae apparently with two unequal teeth anteriorly, teeth equal in size on median and posterior segments.

Distribution. Known only from Friday Harbour, Washington State, west coast of North America.

Eteone tulua sp. nov.

Figures 8a-d, plate 2b

Material examined. Holotype: Australia, Queensland, Middle Banks, northern Moreton Bay, Nov 1983-Nov 1984, coll. P. Saenger and S. Cook, QM GH3617, SEM stub NMV I-53933 segment 11 parapodium.

Paratypes: Queensland, Calliope River, Gladstone, east bank of river, 2.2 m, coarse sand, 1976-1977, van Veen Grab, P. Saenger, AM W19157, 1 paratype; Calliope River, Gladstone, transect 9 on anabranch of Calliope River, 4.1 m, mud, 1976-1977, van Veen Grab, P. Saenger, AM W19158, 1 paratype, SEM stub NMV I-53934 4 posterior-most segments.

Description. Holotype an entire specimen, 88 segments, 10 mm long, 0.6 (0.8) mm wide at segment 10. Size range of paratypes: 107 segments, 17 mm long, 0.4 (0.7) mm wide and 134 segments, 23 mm long, 0.6 (0.9) mm wide (anterior fragments, 1 regenerating posteriorly). Body pale yellow, pigment patterns absent except for posterior half of prostomium which is diffusely pigmented brown-black. Prostomium strongly dorso-ventrally flattened, about as long as wide, anterior margin rounded and only very slightly narrower than posterior margin. Prostomium rounded anteriorly and with small but distinct median indentation of anterior margin. Antennae about three-quarters as long as width of anterior margin of prostomium. One pair of large black eyes located close to posterior margin of prostomium, no nuchal papilla (fig. 8a). Proboscis (examined in ventral dissection) extends back to segment 14, smooth over proximal half but with internal fold producing hollow dorsal ridge. Distal half of proboscis covered with coarse rugose papillae, papillae finer and more sparse in dorsal region, larger laterally and ventrally. Buccal opening with pair of large lateral papillae and ring of 10 or more smaller papillae. First segment enlarged laterally, narrower dorsally. Dorsal pair of tentacular cirri approximately as long as width of first segment, ventral pair slightly shorter and stouter. Second segment with setae, ovoid ventral

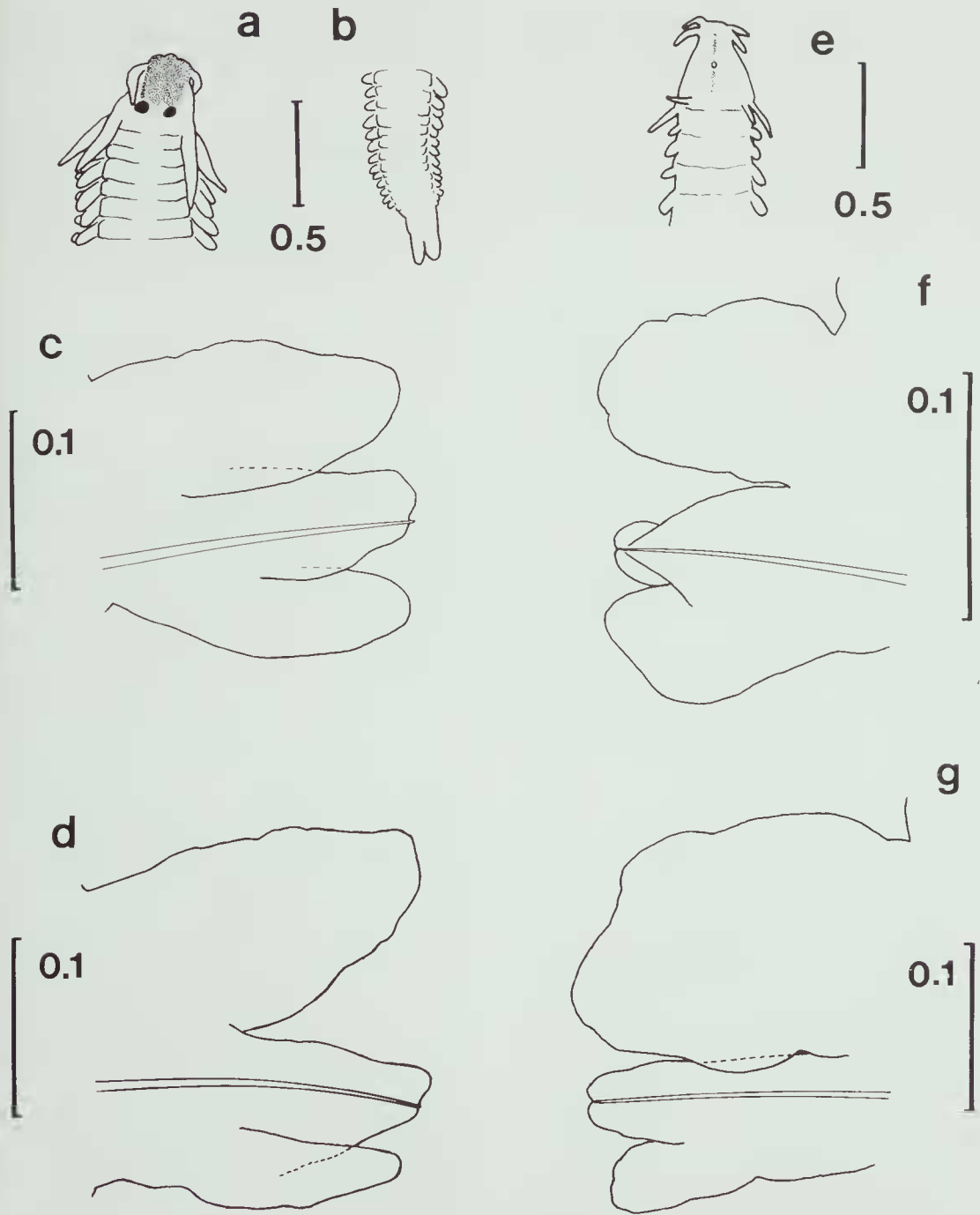


Figure 8. a-d, *Eteone tulua* QM GH3617 holotype: a, prostomium dorsal view (stippling shows area of brown-black pigmentation); b, anal cirri; c, setiger 11 parapodium posterior view; d, setiger 50 parapodium posterior view. e-g, *Hypereteone alba* USNM 493 lectotype: e, prostomium dorsal view; f, setiger 10 parapodium anterior view; g, setiger 92 parapodium anterior view. Scale bars in mm.

cirri and smaller digitiform neuropodia. Ovoid-lanceolate dorsal cirri present from segment 3, as long as other lobes and similar throughout all posterior segments. Neuropodia triangular and ventral cirri lanceolate on anterior segments and of equal length throughout but both becoming narrower posteriorly; ventral cirri cirriform over posterior-most 30 or more segments (figs 8c, d). Anal cirri digitiform, about 4 times as long as wide (fig. 8b). Setae with single large curved tooth and 2 or 3 smaller teeth (pl. 2b).

Remarks. *Eteone tulua* differs from all other species of *Eteone* in having the prostomium about as long as its maximum width and the dorsal tentacular cirri longer than the ventral. The distinctive setae of *E. tulua* which have only two or three small teeth at the base of a single large tooth are unlike any other species of *Eteone*, however this character can only be seen clearly in material examined under SEM.

Etymology. The specific name *tulua* is derived from the name of an Aboriginal tribe whose territory included the Calliope River, Queensland, and is to be treated as indeclinable.

Distribution. Known from Moreton Bay and the Calliope River, south-eastern Queensland, Australia.

Eteone vitiazi Uschakov

Eteone vitiazi Uschakov, 1974: 169, pl. 18 figs 8-10. East of Honshu, North Pacific, 5475 m.

Remarks. The following information is taken from Uschakov (1974): Prostomium longer than wide, antennae large. No eyes or nuchal papilla visible. Proboscis retracted, possibly with lateral papillae. Ventral tentacular cirri much longer and stouter than dorsal pair. Second segment with setae, neuropodia and ventral cirri. Dorsal cirri ovoid, twice as long as wide. Neuropodial lobes much longer than ventral cirri, from segment 25 almost as long as width of body. Setae with large teeth very dissimilar in size. Anal cirri not described.

Uschakov suggested that if the presence of lateral rows of papillae was verified, *E. vitiazi* may have to be transferred to the genus *Mysta*. The proportions of the prostomium and tentacular cirri are similar to species of *Hypereteone* as defined in this paper and are unlike any species of *Mysta*. Examination of the proboscis and anal cirri is required to verify the generic placement of *E. vitiazi*.

Distribution. Known only from the original description, east of Honshu, North Pacific Ocean, 5475 m depth.

Genus *Hypereteone* Bergström, 1914, emended

Diagnosis. Phyllodocidae with 2 pairs of antennae, 2 pairs of tentacular cirri on the first segment. Second segment lacking dorsal cirri. Eversible proboscis with 3 or more longitudinal rugose ridges or rows of tuberculae. Anal cirri long, tapering to fine pointed tip.

Type species. *Eteone lactea* Claparède, 1868, by monotypy.

Remarks. Whether or not the proboscis is described as consisting of rugose ridges or rows of distinct tuberculae depends to some extent on the state of contraction and preservation of the proboscis, but also varies between species. Thus *Hypereteone heteropoda* and *H. lighti* have rugose ridges but lack the distinct rows of tuberculae which are present in *H. foliosa* and most remaining species. I consider that the distinctive cirriform anal cirri represent the major generic character; the presence of numerous longitudinal ridges or rows of tuberculae in all species is further evidence that this group of species represents a monophyletic taxon within *Eteone* sensu lato of authors such as Pleijel (in prep.). Bergström's original definition was based on the absence of setae from the second segment; in this study the structure of the proboscis and anal cirri is given more weight and an emended generic diagnosis is provided. Only four of nine species of *Hypereteone* described here lack setae on the second segment, and even among these species *H. foliosa* exhibits some apparently size-related variability in this character (see Remarks under the species account for *H. foliosa*). Material is too scarce to determine if absence of setae on anterior segments is a variable character in other species of *Hypereteone*.

The critical generic characters unfortunately are often difficult to determine since the proboscis is a challenge to dissect in small specimens and much material is incomplete posteriorly and thus anal cirri will frequently be lost. Many (but not all) species of *Hypereteone* have ventral tentacular cirri much longer than the dorsal tentacular cirri and the first segment often appears to be partly fused to the prostomium; these characters may be sufficient to indicate generic placement until better material comes to hand.

Key to species of *Hypereteone*

The key includes all 9 named species recognised here; *Hypereteone* sp. (see systematic account below) is excluded due to the limited description.

1. Setae present on segment 2 2
- Setae absent on segment 2 6
2. Maximum width of prostomium exceeding length 3
- Prostomium as long or longer than maximum width 5
3. Ventral cirri much smaller than neuropodial lobe *H. barantollae*
- Ventral cirri and neuropodial lobe similar in length, at least on most anterior and median segments 4
4. Ventral tentacular cirri much longer than dorsal; setae with 2 large unequal teeth and many small teeth *H. heteropoda*
- Ventral tentacular cirri only slightly longer than dorsal; setae with 2 large equal and few small teeth *H. lighti*
5. Ventral tentacular cirri twice as long as dorsal; dorsal cirri expanded on posterior segments *H. aesturina*
- Ventral tentacular cirri only slightly longer than dorsal; dorsal cirri not expanded posteriorly *H. fauchaldi*
6. Prostomium twice as long as maximum width *H. tingara*
- Prostomium about as long as maximum width 7
7. Setae with only 1 conspicuous large pointed tooth; ventral tentacular cirri 1.5 times as long as dorsal tentacular cirri *H. otati*
- Setae with 2 unequal teeth, largest tooth with blunt rounded tip; ventral tentacular cirri 2 to 2.5 times as long as dorsal *H. alba*
- Setae with 2 unequal pointed teeth; ventral tentacular cirri 1.5 times as long as dorsal *H. foliosa*

***Hypereteone aesturina* (Hartmann-Schröder)**
comb. nov.

Eteone aesturina Hartmann-Schröder, 1959: 98-101, figs 26-30. El Salvadore.

Remarks. The following summary of important taxonomic characters is taken from Hartmann-Schröder (1959). Prostomium longer than maximum width, with 2 pairs of antennae longer than anterior width of prostomium. Ventral pair of tentacular cirri twice as long as dorsal pair of tentacular cirri. No distinct division between first segment and prostomium. Second segment with setae. Dorsal and ventral cirri ovoid, similar in length anteriorly, dorsal cirri expanded on posterior segments. Neuropodial lobes shorter than ventral cirri. Setae with 2 unequal teeth. Anal cirri long, tapering to a fine point. Proboscis not described.

Hartmann-Schröder's description is sufficient to place this species in the genus *Hypereteone* as defined above.

Distribution. El Zapote, El Salvadore.

***Hypereteone alba* (Webster) comb. nov.**

Figures 8e-g; 14h

Eteone alba Webster, 1879: 134, 135, pl. 2(5) figs 13-16 (in part).

Material examined. USA, New Jersey, Great Egg Harbour, coll. H.E. Webster, USNM 493, lectotype and 2 paralectotypes (not conspecific; see below) and 2 SEM stubs, NMV F53935 segment 11 parapodium from lectotype; NMV F53936 segment 11 parapodium from larger of 2 paralectotypes.

Description. Based on the lectotype, an anterior fragment of 116 segments, 20 mm long, 0.4(0.7) mm wide at segment 11. Colour in alcohol pale yellow-white. Prostomium as long as wide, width at anterior margin half that of posterior margin. Antennae small, about as long as anterior width of prostomium. A deep median dorsal groove extends from anterior margin of the prostomium back to segment 4. An indistinct nuchal papilla appears to be present on posterior section of prostomium. No eyes visible (fig. 8e). Proboscis, examined through ventral dissection, extends back to segment 10, with indistinct longitudinal ridges and terminal ring of about 12 papillae. Ventral pair of tentacular cirri 2-2.5 times as long as dorsal pair. Second segment with very small ventral cirri; neuropodia and setae absent. Third segment with setae, ovoid-lanceolate dorsal cirri, neuropodia and ventral cirri, all similar in size on anterior segments. Dorsal cirri ovoid throughout, becoming expanded by segments 20-30 and reaching maximum size by

segments 50–60 where dorsal cirri about 1.5 times as long as ventral cirri and neuropodia. All parapodial lobes slightly smaller on posterior segments but proportions remaining similar; ventral cirri and neuropodia equal in size throughout (figs 8f, g). Anal cirri unknown. Setae with pair of very unequal teeth, large tooth rounded, and several slightly smaller teeth (fig. 14h).

Remarks. The lectotype, designated in this study, is not conspecific with the paralectotypes; the differences are summarised in Table 1. The paralectotypes also clearly belong in the genus *Hypereteone* as defined here as they have probosces with longitudinal rugose ridges and long cirriform anal cirri, however despite some similarities with *H. heteropoda* and *H. lighti* I am not confident of a specific identification.

Hypereteone alba is placed in the genus *Hypereteone* on the basis of the longitudinal ridges on the proboscis, the strongly unequal tentacular cirri and the absence of setae and neuropodia on the second segment. The presence of long cirriform anal cirri should be confirmed when more material of *H. alba* is examined.

Distribution. The only confirmed record is the lectotype, from Great Egg Harbour, New Jersey, USA.

***Hypereteone barantollae* (Fauvel) comb. nov.**

Eteone barantollae Fauvel, 1932: 72, 73, figs 13a–d. Near Calcutta, India.

Remarks. The following brief description is taken from Fauvel (1932). Prostomium broader than long, with 1 pair of small black eyes. Antennae knob-like. Proboscis smooth basally, with 5 longitudinal rows of papillae anteriorly. Ventral pair of tentacular cirri longer than dorsal pair. Second segment with setae, neuropodia and ventral cirri. Dorsal cirri present from segment 3, ovoid to rounded, approximately symmetrical and carried on distinct cirrophore. Neuropodia and ventral cirri ovoid, ventral cirri much shorter than neuropodia. Anal cirri foliaceous, lanceolate. Setae not described.

Fauvel's original description clearly places this species in the genus *Hypereteone* as redefined above.

Distribution. Near Calcutta, India.

***Hypereteone fauchaldi* (Kravitz and Jones) comb. nov.**

Figures 9a–c; plate 2c

Eteone fauchaldi Kravitz and Jones, 1979: 7–9, figs 2a–g. Columbia River, west coast USA.

Material examined. USA, northern Oregon and southern Washington, off Columbia River mouth, 46°14.5'N, 124°10.5'W, Stn 16C, 33 m, 21 Apr 1975, coll. A. Carey, USNM 57955, 1 paratype, SEM stub NMV F53937 segment 11 parapodium.

Description. A single paratype, 127 segments, 20 mm long, 0.4 (0.6) mm wide. Prostomium trape-

Table 1. Comparison of *Hypereteone alba* lectotype and paralectotypes (USNM 493)

Lectotype	Paralectotypes
anterior margin of prostomium = half width of posterior margin	anterior margin of prostomium = $\frac{1}{3}$ – $\frac{1}{2}$ width of posterior margin
retracted proboscis extends back 9 setigers	retracted proboscis extends back 3–6 setigers
ventral tentacular cirri longer than dorsal tentacular cirri	dorsal and ventral tentacular cirri equal in length
neuropodia and setae absent from second segment	second segment with neuropodia and many long setae
setae with pair of teeth very unequal in size (fig. 14h)	setae with pair of large teeth similar in size (fig. 14i)

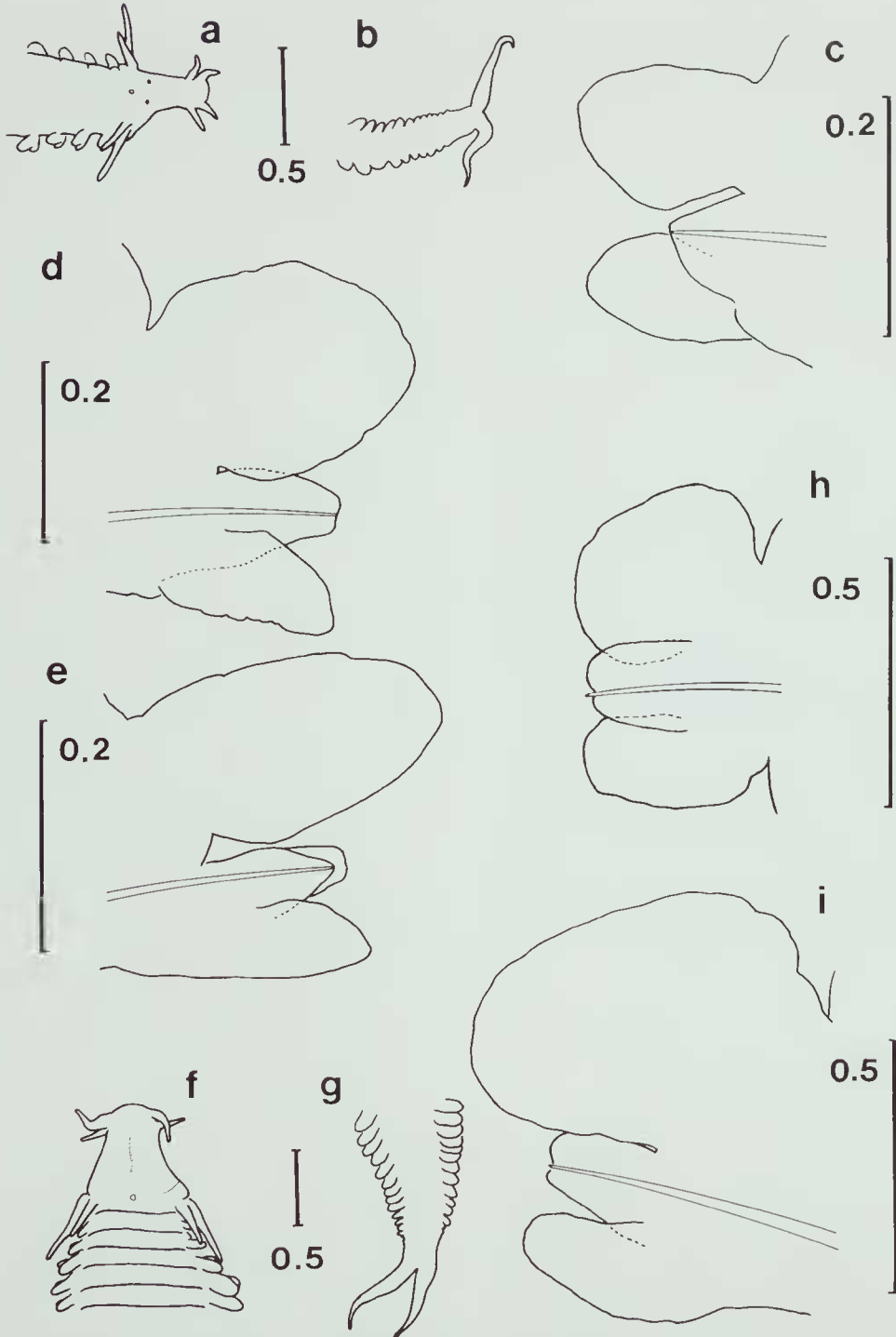


Figure 9. a-e, *Hypereteone fauchaldi* USNM 57955 paratype: a, prostomium dorsolateral view; b, anal cirri; c, setiger 10 parapodium anterior view; d, setiger 50 parapodium posterior view; e, setiger 100 parapodium posterior view. f-i, *Hypereteone foliosa* MNHN unregistered: f, prostomium dorsal view; g, anal cirri; h, setiger 21 parapodium anterior view; i, setiger 189 parapodium anterior view. Scale bars in mm.

zoid, 2.5 times as long as wide, anterior margin half width of posterior margin. Antennae as long as anterior width of prostomium. Dorsal pair of antennae located at lateral anterior extremities of prostomium, second pair slightly posterior and ventral to first. One pair of faint red subdermal eyes, widely spaced, close to posterior margin of prostomium. Nuchal papilla on posterior margin (fig. 9a). Proboscis, examined through ventral dissection, extends back to 11th segment, with a rugose dorsal band becoming more tuberculate distally; elsewhere smooth. Ventral pair of tentacular cirri as long as width of first segment, dorsal pair narrower and slightly shorter. Second segment with only a few setae, neuropodia and lanceolate ventral cirri. Dorsal cirri present from segment 3, ovoid in shape and of similar length to ventral cirri over anterior 50 segments. Dorsal cirri becoming substantially larger than ventral cirri and neuropodia on posterior segments. Ventral cirri lanceolate and acuminate throughout, up to twice as long as neuropodia on anterior segments, reducing posteriorly and as long as neuropodia from segment 50 (figs 9c-e). Anal cirri stout and fleshy basally, tapering to fine point, as long as last 6-8 segments (fig. 9b). Setae with single long curved tooth and several smaller teeth in 2 or 3 tiers (pl. 2c).

Remarks. The prostomium of the paratype examined here is slightly more elongate than that of the specimen figured by Kravitz and Jones (1979). The description of the proboscis differs slightly also: Kravitz and Jones described the proboscis as tuberculate, whereas the proboscis of paratype USNM 57955 is apparently tuberculate only in a dorsal band; the discrepancy may be due to the difficulty of dissecting this small structure. The description above otherwise agrees with the original.

***Hypereteone foliosa* (Quatrefages) comb. nov.**

Figures 9f-i; plate 2d

Eteone foliosa Quatrefages, 1865: 146, 147. France.

Eteone pusilla. - Malmgren, 1865: 102, pl. 15 figs 37a-d (not Ørsted, 1843).

Material examined. Scandinavia, Bohuslan (= "Bahusia" in Malmgren, 1865), coll. S. Loven, SMNH 5952, 4 specimens (material identified as *E. pusilla* by Malmgren, 1865).

France, Tatihou (near to St Vaast la Houge, east of Cherbourg, type locality), 1898, coll. M. Gravier, MNHN unregistered, 100+ specimens, SEM stub NMV F53938 segment 21 RHS parapodium and segments 191, 192.

Morocco, "No. 10", 1903, coll. M. Buchet, MNHN unregistered, 1 specimen (det. Fauvel 1942 as *E. lactea*).

Description. Size range of material examined: 256 segments, 66 mm long, 0.7(1.2) mm wide to 239 segments (regenerating posteriorly), 77 mm long, 1.2(1.6) mm wide. Colour in alcohol pale yellow-brown. Prostomium as long as wide, anterior margin rounded, half width of posterior margin, with median longitudinal dorsal groove. Eyes not visible. Anterior pair of antennae slightly shorter than second pair which are situated immediately posterior to first pair. A small but distinct nuchal papilla at posterior margin of prostomium (fig. 9f). Proboscis long and fully retracted in all specimens, extending back 26-29 segments, very narrow over basal three-quarters of its length, becoming much wider on its distal quarter. Internally with 6 longitudinal rugose ridges, dorsal row being 2 tuberculae wide, others comprised of single rows of irregular tuberculae. A terminal ring of 18 or more (22 or 23 according to Pleijel, in prep.) papillae and pair of large lateral papillae. Ventral pair of tentacular cirri about three-quarters as long as width of first segment, dorsal pair narrower and about three-quarters as long as ventral pair. Second segment with ovoid ventral cirri similar in size to those of subsequent segments, without neuropodia or setae. Third segment with setae, ovoid dorsal cirri as long as ventral cirri, and smaller triangular-lanceolate neuropodia. Dorsal cirri roughly circular in shape on anterior segments and asymmetrical, becoming asymmetrical and ovoid on posterior segments. Ventral cirri ovoid, slightly exceeding length of neuropodia on anterior and median segments. Ventral cirri becoming slightly reduced posteriorly, about as long as neuropodia from about segment 150. Neuropodia lanceolate lobe throughout with bifid tip divided by the tip of the aciculae which project slightly (figs 9h, i). Anal cirri stout basally, at least 6 times as long as wide, tapering to a fine point and as long as posterior-most 10-14 segments (fig. 9g). Setae with pair of large teeth unequal in length and 3 or 4 tiers of uniformly sized small teeth (pl. 2d).

Remarks. *Hypereteone lactea* Claparède, 1868, the type species of the genus, may be a junior synonym of *H. foliosa*, however there is no detailed description available of material from the type locality of *H. lactea* (Gulf of Naples). Bergström (1914) recorded *H. lactea* from the Mediterranean as well as the North Atlantic. Pettibone (1963) recorded *H. lactea* from the Atlantic coast of the USA however this material should be compared with the above description of *H. foliosa* and with the several related species from the USA described in this paper before such range extensions are

accepted. *Eteone caeca* Ehlers, 1874 from Galway, Ireland was synonymised with *H. foliosa* by Hartman, 1959 but without citing any authority. *Eteone malmgreni* Michaelsen, 1897 was introduced as a new name for material originally identified by Malmgren, 1865 as *E. pusilla* Ørsted; *E. malmgreni* Michaelsen, 1897 may also be a junior synonym of *Hypereteone lactea* as asserted by Hartman, 1959.

The above key to species of *Hypereteone* utilises the absence of setae from the second segment as a taxonomic character, however there may be some variability in this character, in *H. foliosa* at least: Eliason (1962) showed that some small specimens of *E. lactea* (presumably = *H. foliosa*) from the Öresund possess setae on one side of the second segment whereas all larger specimens were lacking setae on the second segment. F. Pleijel (pers. comm.) has also drawn my attention to variability in this character. Colour is also apparently variable: Pleijel (in prep.) describes the colour in life and preserved as cream-white whereas I have recorded the colour as pale yellow-brown (however, all specimens examined here have been stored in alcohol for over 80 years).

Distribution. Swedish west coast, North Sea, Atlantic coast of France, possibly Mediterranean Sea.

Hypereteone heteropoda (Hartman) comb. nov.

Figures 10a-e; plate 3a

Eteone heteropoda Hartman, 1951: 31-33, pl. 9 figs 1-8. Gulf of Mexico.

Material examined. USA, Florida: label reads: "n1820 Fla 3", AHF 0119, holotype and SEM stub NMV F53939 segment 11 RHS parapodium (Hartman's original description lists 2 Florida localities as sources of original material: Stingaree Flats, upper end of Lemon Bay, Jan 1938; and Ochlockonee Bay, Franklin Co., Mar 1950, coll. L.M. Henry). Mississippi, Deer Island, near Biloxi, Dec 1943, coll. M.W. Williams, USNM 21558, 3 paratypes and SEM stub NMV F53940 segment 11 parapodium.

Description. (from holotype). Holotype consisting of 2 fragments: anterior fragment 128 segments, 48 mm long, 1.2 (2.0) mm wide; posterior fragment carries anal cirri, 40 segments, 11 mm long. Prostomium a truncate triangle, slightly shorter than its maximum width at posterior margin. Width of prostomium at anterior margin third width at posterior margin. Antennae slightly shorter than anterior margin of prostomium. Anterior pair of antennae distally inserted on prostomium, second pair located immediately posterior to first. Antennae stout basally, tapering to very fine tip, appearing almost biarticulate. One pair of dark subdermal

eyes, widely spaced, situated close to posterior margin of prostomium. Prostomium with median dorsal groove and minute dorsal papilla on posterior margin. Proboscis of holotype fully everted and as long as anterior 13 segments. Proboscis rugose with 8 distinct longitudinal ridges and ring of 20 fleshy papillae around bucal opening (fig. 10a). Dorsal pair of tentacular cirri thinner and two-thirds length of ventral pair. Second segment with setae, neuropodia and triangular ventral cirri about twice neuropodial length. Segment 3 with cirriform dorsal cirri and more numerous setae. Dorsal cirri lanceolate with rounded tip from segment 3, of similar length to neuropodia anteriorly, dorsal cirri becoming triangular acuminate, thick and fleshy from about segment 40, dorsal cirri longer than other parapodial lobes on posterior 30 segments. Neuropodia elongate-lanceolate throughout. Ventral cirri triangular with acuminate tip, gradually reducing in size posterior to segment 40, by about segment 60 reduced to a small triangular process attached to ventral margin of neuropodia (figs 10c-e). Body thick anteriorly, narrowing considerably and parapodia becoming longer and larger from segments 30-40. Anal cirri thick and fleshy basally, tapering to a fine tip, as long as posterior 6-8 segments (fig. 10b). Setae with 2 large teeth slightly unequal in size and many small teeth in 6-8 tiers (pl. 3a).

Remarks. The description above agrees well with that of Hartman (1951). The paratypes are similar except that the posterior parapodia are not grossly inflated as in the gravid holotype, nor are the dorsal cirri of segment 2 cirriform as in the holotype; in the paratypes they are lanceolate lobes, similar in shape, but smaller than those of subsequent segments.

Distribution. Maine to Gulf of Mexico, east coast of USA (Pettibone, 1963).

Hypereteone lighti Hartman comb. nov.

Figures 11a-d; 14j

Eteone lighti Hartman, 1936a: 127, 130, figs 36-39. Central California.

Material examined. USA, California, San Francisco Bay, Mar 1935, coll. and don. O. Hartman, USNM 20333, 2 syntypes of *Eteone lighti* and SEM stub NMV F53941 segment 11 parapodium from entire of 2 syntypes (2 labels read "type" in Hartman's hand-writing and a third USNM label reads "holotype" but the vial contains 2 specimens, thus these and the paratypes said by Hartman (1936a) to have been deposited in the AHF are all considered here to be syntypes).

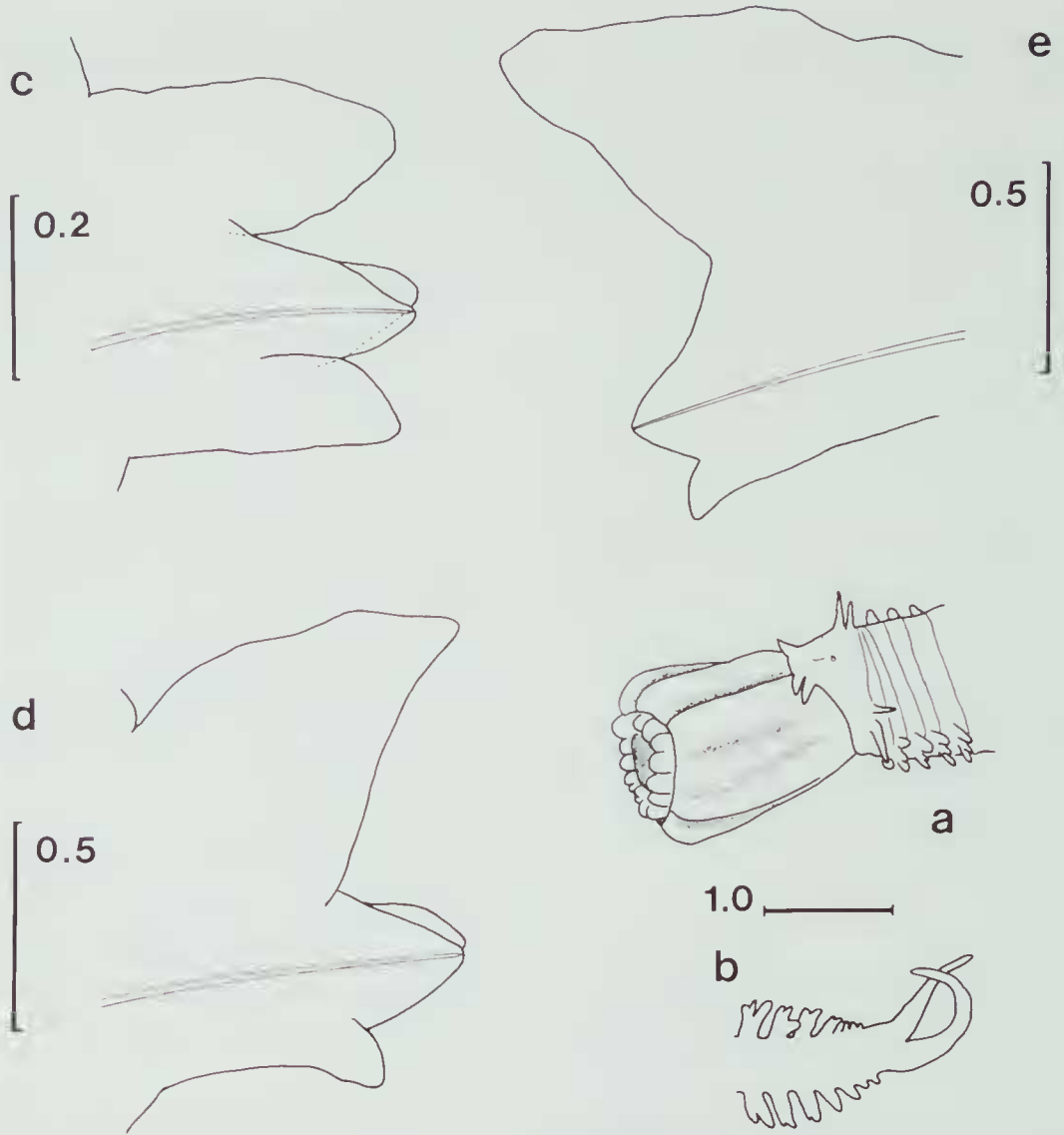


Figure 10. *Hypereteone heteropoda* AHF holotype: a, prostomium and everted proboscis dorsolateral view; b, anal cirri; c, setiger 10 parapodium posterior view; d, setiger 50 parapodium posterior view; e, setiger 100 parapodium anterior view. Scale bars in mm.

Description. (based on 2 syntypes of *E. lighti*) One entire specimen, 81 segments, almost broken between segments 59/60, 22 mm long, 0.6(1.0) mm wide. Second syntype an anterior fragment of 42 segments, 16 mm long, 1.0(1.6) mm wide. Colour pale yellow with no markings or patterns. Prostomium shorter than maximum width, narrow for two-thirds of length anteriorly, quickly broadening to become 3 times as wide posteriorly. Antennae not quite as long as anterior width of

prostomium. Dorsal pair of antennae terminally located, ventral pair located posteriorly to first pair. Eyes a pair of faint red subdermal pigmented patches on posterior third of prostomium. Prostomium with continuous median dorsal groove (fig. 11a). Nuchal papilla not visible. Proboscis (not previously dissected) examined by ventral dissection in both syntypes, smooth internally, and without papillae but with faint longitudinal striations and raised dorsal ridge distally. Probosces

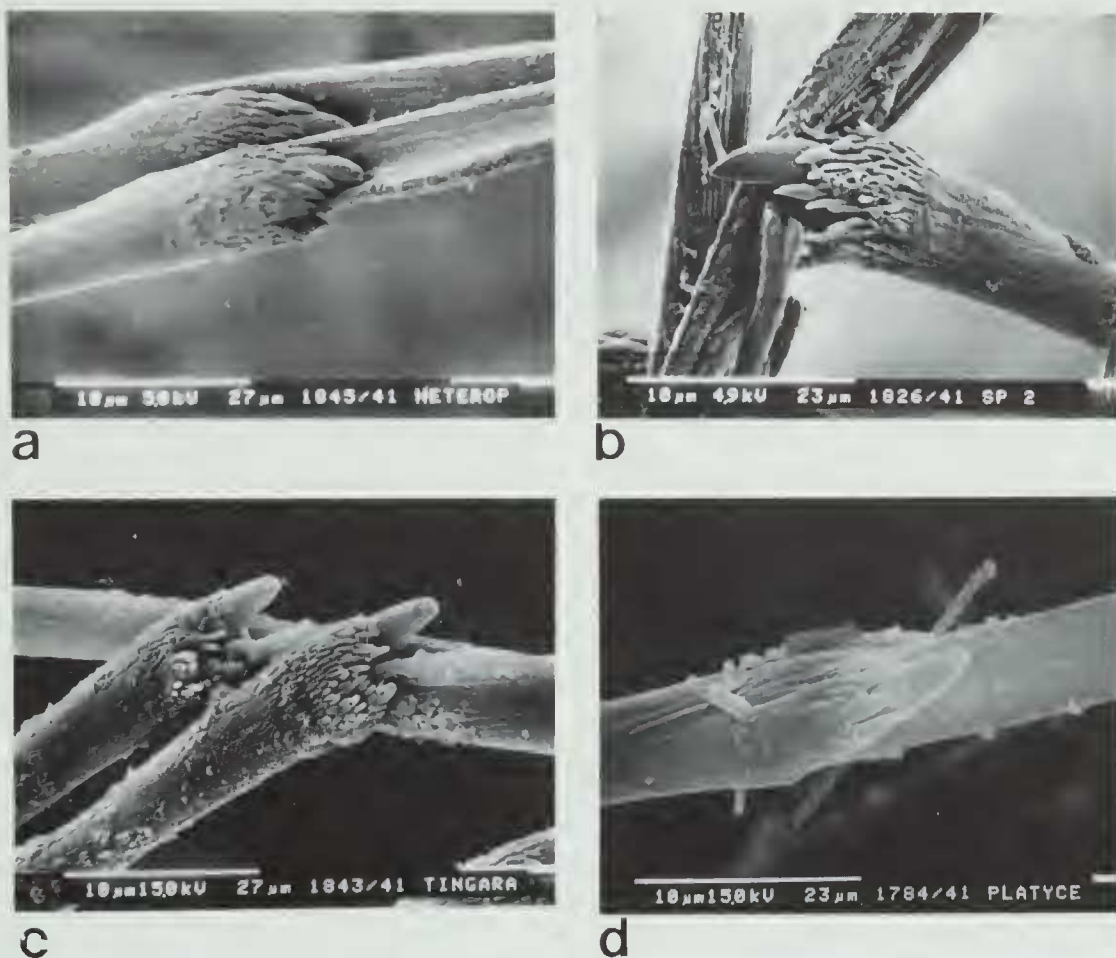


Plate 3. Scanning electron micrographs of species of *Hypereteone* and *Mysta*. a, *H. heteropoda* AHF holotype (from setiger 10); b, *H. tingara* AM W201453 paratype (from setiger 25); c, *H. tingara* NMV F52623 holotype (from setiger 30); d, *M. platycephala* NMV F52623 (from median setiger). Scale bars in μm .

extend back to segments 5–7. Tentacular cirri of similar length, about quarter width of first segment. Second segment with setae, reduced ventral cirri and neuropodia. Segment 3 with triangular acuminate dorsal cirri, rounded neuropodia and smaller triangular ventral cirri. Dorsal cirri becoming ovoid with rounded tips, parapodial lobes similar in proportion on all subsequent segments but each segment becoming longer in proportion to width from segments 20–25 (figs 11c, d). Anal cirri as long as posterior 5 segments, tapering to fine point (fig. 11b). Setae with pair of large teeth equal in size and several smaller teeth in 2 or 3 tiers (fig. 14j).

Remarks. The above description agrees closely with that of Hartman, 1936a.

Distribution. California, west coast of North America.

Hypereteone otati sp. nov.

Figures 11e–h; 14k

Material examined. Holotype: Queensland, between Round Point and Rodney Island, Cape York, intertidal sand flats, 15 Feb 1985, P. Saenger, AM W201455, SEM stub NMV F53942 segments 98–101.

Description. Holotype a complete worm in 2 fragments for a total of 234 segments, 50 mm long, 0.7(1.0) mm wide. Colour in alcohol bright yellow with narrow longitudinal brown stripe on dorsum of anterior 50–55 segments; dorsal cirri of all but anterior 10 segments also with brown pigmentation.

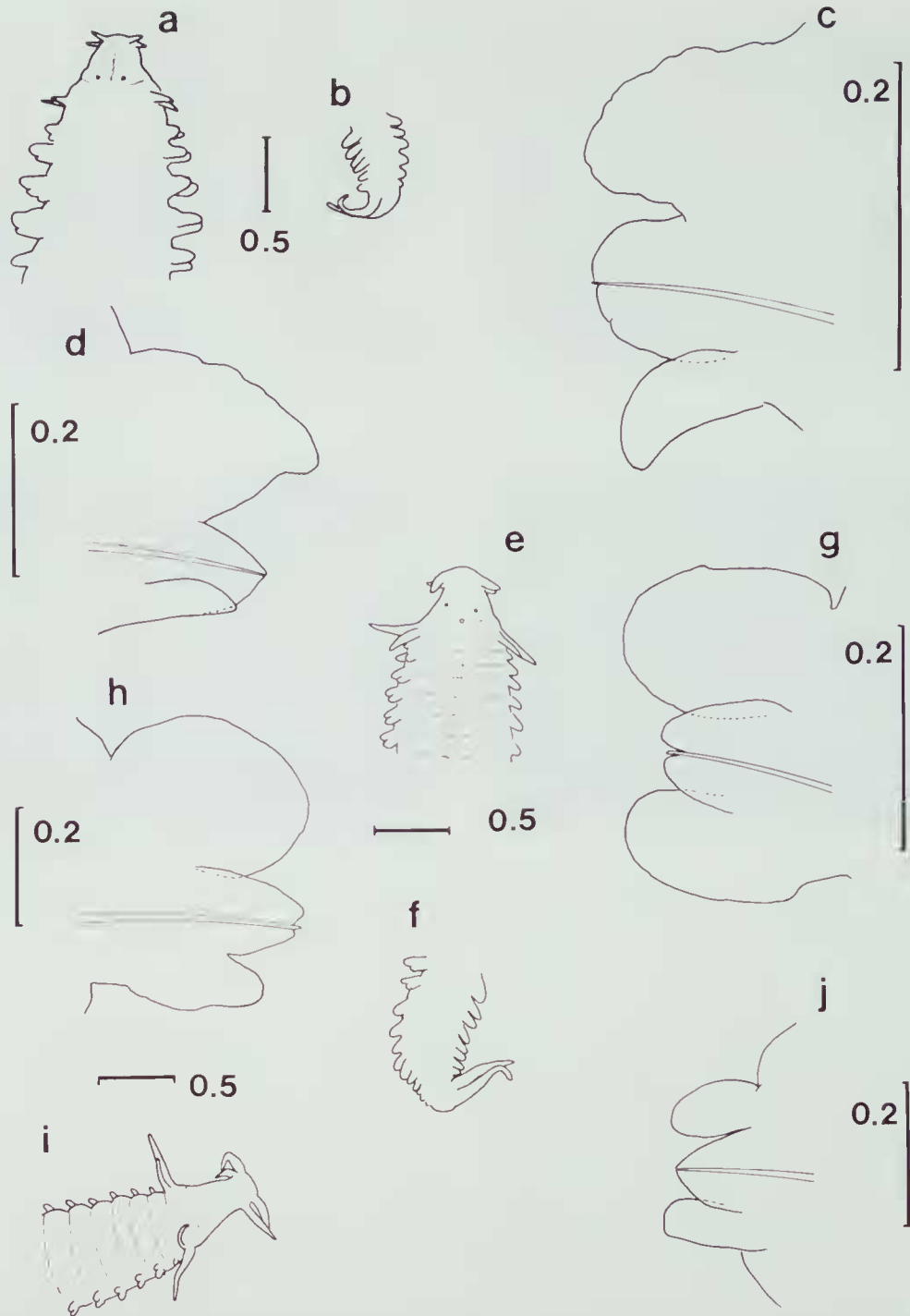


Figure 11. a, *Hypereteone lighti* larger of 2 syntypes USNM 20333 prostomium dorsal view. b-d, *Hypereteone lighti* smaller of 2 syntypes USNM 20333: b, anal cirri; c, setiger 10 parapodium anterior view; d, setiger 50 parapodium posterior view. e-h, *Hypereteone otati* AM W201455 holotype: e, prostomium dorsal view; f, anal cirri; g, setiger 11 parapodium anterior view; h, setiger 70 parapodium posterior view. i, j, *Hypereteone tingara* NMV F52623 holotype: i, prostomium dorsolateral view; j, setiger 20 parapodium anterior view. Scale bars in mm.

Prostomium as long as wide, anterior margin rounded, about half width of posterior margin, 1 pair of dark subdermal eyes and faintly visible nuchal papilla (fig. 11e). Proboscis extending back 18 segments, with 4 longitudinal rows of irregular tuberculae, dorsal row 2 tuberculae wide except for extreme distal region where single row is present, otherwise all ridges comprised of single rows of papillae. Proboscis with terminal ring of about 12 large papillae and pair of large lateral papillae. Dorsal pair of tentacular cirri about as long as width of first segment, and two-thirds as long as ventral pair. Second segment with ovoid ventral cirri similar in size to those of subsequent segments; setae, neuropodia and dorsal cirri absent. Third segment with a few setae, ovoid dorsal and ventral cirri similar in size, and barely visible rudimentary neuropodial lobe. Neuropodia gradually increasing in size until about as long as ventral cirri by segments 10–15. Neuropodia strongly bifid, with conspicuous brown tips of aciculae projecting slightly. Neuropodia slightly exceeding length of ventral cirri on median segments, reducing on posterior segments so that ventral cirri are slightly longer. Dorsal cirri initially ovoid, symmetrical and about equal to ventral cirri in size, by segment 40–50 becoming broader, ovoid to circular, asymmetrical and exceeding length of ventral cirri. Dorsal cirri similar in size and shape and larger than ventral cirri on posterior segments (figs 11g, h). Anal cirri long, cirriform, as long as posterior-most 5 or 6 segments (fig. 11f). Setae with 1 large tooth on 1 side of blade and many small teeth in 4 or 5 densely-packed tiers (fig. 14k).

Remarks. *Hypereteone otati* is most similar to *H. foliosa* as described above. Aside from the differences in colouration (live and recently preserved specimens of *H. foliosa* are a uniform cream-white, Pleijel, in prep.), *H. otati* can also be distinguished from the related species by the structure of the proboscis, which has fewer tuberculate ridges and terminal papillae than *H. foliosa* and the dorsal and ventral cirri which are both broader in *H. foliosa*. The two species can also be distinguished by the setae: only one large tooth is visible in *H. otati* whereas two unequal teeth are present in *H. foliosa*.

Etymology. The specific name *otati* is derived from the name of the Aboriginal tribe which once inhabited the type locality, and is to be treated as indeclinable.

Distribution. Recorded only from Cape York, northern Australia.

Hypereteone tingara sp. nov.

Figures 11i, j; plates 3b, c

Material examined. Holotype: Australia, Victoria, Western Port, 38°22.28'S, 145°30.24'E, str WBES-1734, 5 m. sand, 29 Nov 1973, NMV F52623 and SEM stub NMV F53944 segment 31 RHS parapodium.

Paratypes: Victoria, Bass Strait, 112 km S of Lakes Entrance, 39°00'S, 148°24.8'E, Esso-Gipps Stn 20, 95 m. sand, May 1969, C. Phipps, AM W201454, paratype. Tasmania, off St Helens Point, 41°20.6'S, 148°30'E, BMR stn 573-2038, 110 m, fine clayey sand, 25 Mar 1973, P.H. Coleman on R.V. "Sprightly", AM W201453, paratype and SEM stub NMV F53943 segment 26 RHS parapodium.

Description. The holotype is an anterior fragment, 52 segments, 11 mm long, 0.9 (1.0) mm wide. Size range of paratypes: 53 segments, 8 mm long and 81 segments, 10 mm long; both anterior fragments 0.4 (0.6) mm wide. Body uniform pale yellow throughout, no obvious markings or pigment patterns. Prostomium twice as long as maximum width, tapering to narrow rounded point anteriorly, width at anterior margin half that at posterior margin. Neither eyes nor nuchal papilla visible. Antennae equal in length, about 1.5 times anterior width of prostomium. Dorsal pair of antennae terminal, ventral pair slightly posterior to first pair (fig. 11i). First segment fused to prostomium dorsally, a slight division visible laterally and extending ventrally to buccal opening. Ventral pair of tentacular cirri as long as breadth of first segment, dorsal pair narrower and two-thirds as long as ventral pair. Proboscis, examined through ventral dissection, extends back internally to segment 15, damaged in dissection but with 3 (or possibly 4) longitudinal rows of large low rugose papillae, each row 1 papilla wide, proboscis apparently smooth between rows. Second segment without dorsal cirri, neuropodia, or setae; only with small ovoid ventral cirri. Third segment with setae, flattened digitiform dorsal cirri and neuropodium and ovoid ventral cirri. Dorsal cirri and neuropodia of about first 10 segments similar in length, ventral cirri slightly longer (fig. 11j). Ventral cirri and neuropodia exceeding dorsal cirri in length from about segment 25 and posteriorly. Body narrows significantly over anterior 10 segments, approximately constant in width posteriorly but segments noticeably more deeply divided posterior to about segment 30. Anal cirri unknown. Setae with pair of large teeth unequal in size and 3 or 4 tiers of smaller teeth (pls 3b, e).

Remarks. This species is placed in the genus *Hypereteone* on the basis of the characteristic struc-

ture of the proboscis and prostomium and the proportions of the tentacular cirri, all of which agree with the other species in the genus. The anal cirri are unknown since all specimens are incomplete posteriorly; when more specimens are collected *H. tingara* should be found to possess long cirriform anal cirri in agreement with the generic definition.

Hypereteone tingara is similar to two other species of *Hypereteone* in which the prostomium is also longer than its maximum width: *H. aestuarina* and *H. fauchaldi*. *Hypereteone tingara* can be distinguished from both species by the absence of setae on segment 2 and the ventral cirri which are larger than the dorsal cirri on posterior segments (in *H. aestuarina* and *H. fauchaldi* setae are present on segment 2 and the dorsal cirri are larger than or similar in size to the ventral cirri on posterior segments).

Hypereteone tingara can be distinguished from the only other Australian species in the genus, *H. otati*, by the colouration, which is bright yellow in *H. otati*; the prostomium and antennae which are more elongate in *H. tingara*; and the dorsal cirri, which are smaller and narrower in *H. tingara*.

Hypereteone tingara appears to be uncommon and is only known from three specimens from south-eastern Australia despite several major benthic surveys of coastal bays and the continental shelf in the region.

Etymology. The specific name *tingara* is derived

from an Australian Aboriginal word meaning the sea, and is to be treated as indeclinable.

Distribution. South-eastern Australia: Victoria, Bass Strait and Tasmania.

Hypereteone sp.

Eteone ornata. — Day, 1967: 140, fig. 5.1f-i (not Grube, 1878).

Remarks. Day's (1967) description (proboscis with three to four longitudinal rows of papillae, ventral cirri longer than dorsal cirri, and setae lacking on second segment) clearly places this apparently undescribed species in the genus *Hypereteone* as defined in this paper.

Distribution. Mozambique.

Genus **Mysta** Malmgren, 1865

Diagnosis. Phyllococidae with 2 pairs of antennae. 2 pairs of tentacular cirri on first segment. Segment 2 lacking dorsal cirri. Eversible proboscis with 2 lateral rows of leaf-like papillae, 1 row on each side of proboscis, proboscis dorsally with band of small spinose papillae. Anal cirri digitiform with blunt rounded tips, up to 4 times as long as maximum width.

Type species. *Mysta barbata* Malmgren, 1865, by monotypy.

Remarks. The diagnosis above follows the concept of Uschakov (1974) and Fauchald (1977).

Key species of the genus *Mysta*

The key excludes two poorly-known species: *M. syphodonta* delle Chiaje and *Mysta* sp. which appear to be valid species (see species accounts below) but cannot be distinguished on the basis of available published descriptions; if included both species would key out as far as couplet 5.

1. Dorsal cirri circular to kidney-shaped, width equal to or exceeding length 2
— Dorsal cirri ovoid, longer than wide 3
2. Proboscis with more than 20 large papillae on each side; dorsal pair of tentacular cirri much longer than ventral pair *M. barbata*
— Proboscis with fewer than 10 large papillae on each side; dorsal pair of tentacular cirri equal to or only slightly longer than ventral pair *M. picta*
3. Orifice of proboscis with 1 large teat-like papilla situated dorsally
..... *M. tchangsii*
— Orifice of proboscis without large teat-like papilla 4
4. Dorsum with 3 distinct dark violet longitudinal stripes *M. ornata*
— Dorsum without distinct violet longitudinal stripes 5
5. Lateral rows of papillae extend over almost the full length of the proboscis; dorsal tentacular cirri equal to or only slightly longer than ventral
..... *M. platycephala*
— Lateral rows of papillae confined to basal half of the proboscis; dorsal tentacular cirri much longer than ventral *M. maculata*

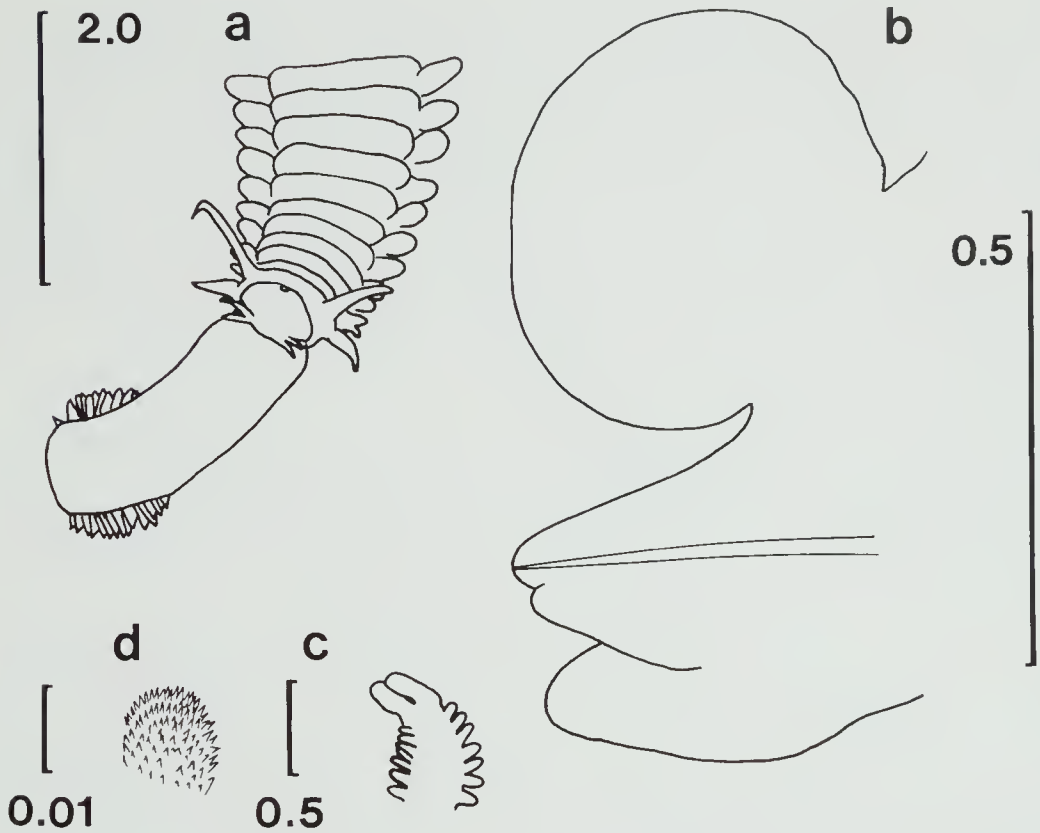


Figure 12. a, b, *Mysta barbata* SMNH 2417 holotype: a, prostomium and everted proboscis; b, setiger 25 parapodium anterior view. c, d, *Mysta papillifera* SMNH 2418 syntype: c, anal cirri; d, spinose pad from dorsum of proboscis. Scale bars in mm.

Mysta barbata Malmgren

Figures 12a–d; 14l

Mysta barbata Malmgren, 1865: 101, pl. 15 figs 34, 34a–34d.

Mysta papillifera Théel, 1879: 33, 34, pl. 2 figs 25–28.

Material examined. Sweden, Bohuslan, Gullmaren, A.J. Malmgren, SMNH 2417, syntype of *Mysta barbata* and SMNH SEM stub setiger 21 parapodium.

USSR, Arctic Ocean, Novaya Zemlya, Cap Grebeni, 29–31 Jul 1875, coll. Stuxb. and Théel, SMNH 2418, syntypes of *Mysta papillifera*, 2 entire specimens and 3 fragments; 4 or 5 separate specimens may be represented.

Description. Syntype of *Mysta barbata* in 4 fragments: anterior fragment of 25 segments, 6.5 mm long (excluding everted proboscis), 1.2 (2.0) mm wide; fragment almost complete posteriorly but lacking anal cirri, 142 segments, at least 40 mm long; plus 2 transverse sections of a single and a pair of median segments. Prostomium 1.5 times as long as maximum width at posterior margin, width

at anterior margin half width at posterior margin. Dorsal pair of antennae about as long as anterior width of prostomium, ventral pair of antennae slightly shorter. Neither eyes nor nuchal papilla visible, though distinct pit situated mid-dorsally on posterior margin of prostomium (fig. 12a). Proboscis approximately half-way everted, about as long as 14 anterior segments, ventral dissection reveals lateral row of over 40 triangular papillae along each side of distal third of the prostomium (fig. 12a). Proboscis dorsally with numerous minute papillae in transverse rows, each papilla with pad of 40–50 curved teeth (fig. 12d), smooth elsewhere. Dorsal pair of tentacular cirri about as long as width of first setiger, ventral pair two-thirds as long and slightly thicker basally. Second segment with setae, lanceolate neuropodia and ventral cirri, about equal in length. Dorsal cirri present from segment 3, about as long as neuropodial lobes initially and flattened digitiform, becoming ovoid to circular on subsequent segments, almost circular

from setiger 20 (fig. 12b). Neuropodia and ventral cirri similar in size and shape throughout but relatively shorter than dorsal cirri posterior to setiger 20. Anal cirri lost from holotype. Setae with pair of large teeth slightly unequal in size and rows of successively smaller teeth at base of large tooth (fig. 14l).

Remarks. The syntypes of *Mysta papillifera* are smaller specimens in which the probosces are fully retracted; these specimens agree in every respect with the description of *M. barbata* except that the dorsal tentacular cirri are slightly longer than in the holotype of *M. barbata*. The anal cirri (missing from the holotype) consist of a pair of rounded digitiform lobes about three times as long as wide. *Eteone striolata* Levinsen, 1882 (junior homonym, not Bobretsky, 1868) was synonymised with *M. barbata* by Hartman (1959).

Distribution. Recorded from Arctic Ocean, North Sea, Sea of Okhotsk, Sea of Japan (Pleijel, in prep.).

Mysta maculata Treadwell

Figures 13a–d; 14m

Mysta maculata Treadwell, 1920: 593, 594, figs 1–4. Philippines.

Material examined. Philippines, Sulu Archipelago, Sulade Island, vicinity of Siasi, "Albatross" sin 5146, 24 fm [44 m], coral sand and shell bottom, 16 Feb 1908, USNM 18940, holotype, SEM stub NMV F53945, segment 21 LHS parapodium.

Description. The holotype is an anterior fragment of 140 segments, about 50 mm long, 2.0 (2.5) mm wide at setiger 11. Colour in alcohol pale brown with dark spots in some dorsal cirri and scattered points of dark brown pigmentation on dorsum. Prostomium lens shaped, twice as wide as long, anterior margin of prostomium half as wide as maximum width of prostomium, which occurs in mid-section. Antennae as long as width of prostomium at anterior margin. Only dorsal pair of antennae visible from above, ventral pair, which are slightly stouter, can be seen only in ventral view. One pair of dark subdermal eyes close to posterior margin of prostomium. Nuchal papilla absent (fig. 13a). Proboscis retracted, extends back internally to setiger 16, with about 18 large discoid papillae on each side forming 2 lateral rows over basal half of proboscis, distal half being free of lateral papillae. Dorsal surface of proboscis carries dense band of minute small denticulate papillae in transverse rows, each papilla with 40–50 long teeth (fig. 13b). Ventral surface of proboscis without papillae. Ven-

tral pair of tentacular cirri half as long as width of first segment, dorsal pair slightly longer than ventral pair. Second segment with setae, lanceolate ventral cirri and neuropodium of equal length. Dorsal cirri present from segment 3, initially ovate and of similar length to neuropodia, becoming broader and attached by distinct stalk by setiger 10. Dorsal cirri circular to ovate and extending as far as neuropodia on all subsequent segments. Neuropodia and ventral cirri lanceolate lobes, similar in shape and length throughout all segments (figs 13c, d). Anal cirri unknown. Setae with 1 large tooth and 2 rows of successively smaller teeth (fig. 14m).

Remarks. *Mysta maculata* is similar to *M. platycephala* from Australian waters but differs in the relative lengths of the dorsal and ventral tentacular cirri which are equal in *M. platycephala* but unequal in *M. maculata*, the teeth on the dorsal band of proboscidial papillae which are longer and more numerous in *M. maculata*, and in the ventral cirri which are reduced to a small lobe in *M. platycephala* whereas in *M. maculata* the ventral cirri and neuropodia are similar and equal in size throughout.

Distribution. Known only from the holotype, Sulu Archipelago, Philippine Islands.

Mysta ornata (Grube)

Eteone ornata Grube, 1878 [not seen]. – Izuka, 1912: 201.

Mysta ornata. – Imajima and Hartman, 1964: 65, 66. – Uschakov, 1974: 172, pl. 18 figs 1–4.

Remarks. The following description is abstracted from Uschakov (1974): Dorsum with 3 brown-violet longitudinal stripes. Proboscis with 2 lateral rows of papillae. Dorsal tentacular cirri slightly longer than ventral tentacular cirri. Dorsal cirri ovoid, longer than wide and attached by distinct pedicel; ventral cirri slightly longer than neuropodia. Setae with 2 large teeth and a number of smaller teeth at the articulation. Anal cirri large, about twice as long as wide.

Izuka (1912) and Uschakov (1974) agreed that the conspicuous dorsal stripes distinguish *Mysta ornata* from related species. Uschakov's (1974) record appears to be only the second valid record of this species (the records of Fauvel, 1932, 1933, 1953b and Day, 1967 were referred to other species by Uschakov).

Distribution. Known only from the original description and a subsequent record (Peter the Great Bay), both in the northern Sea of Japan.

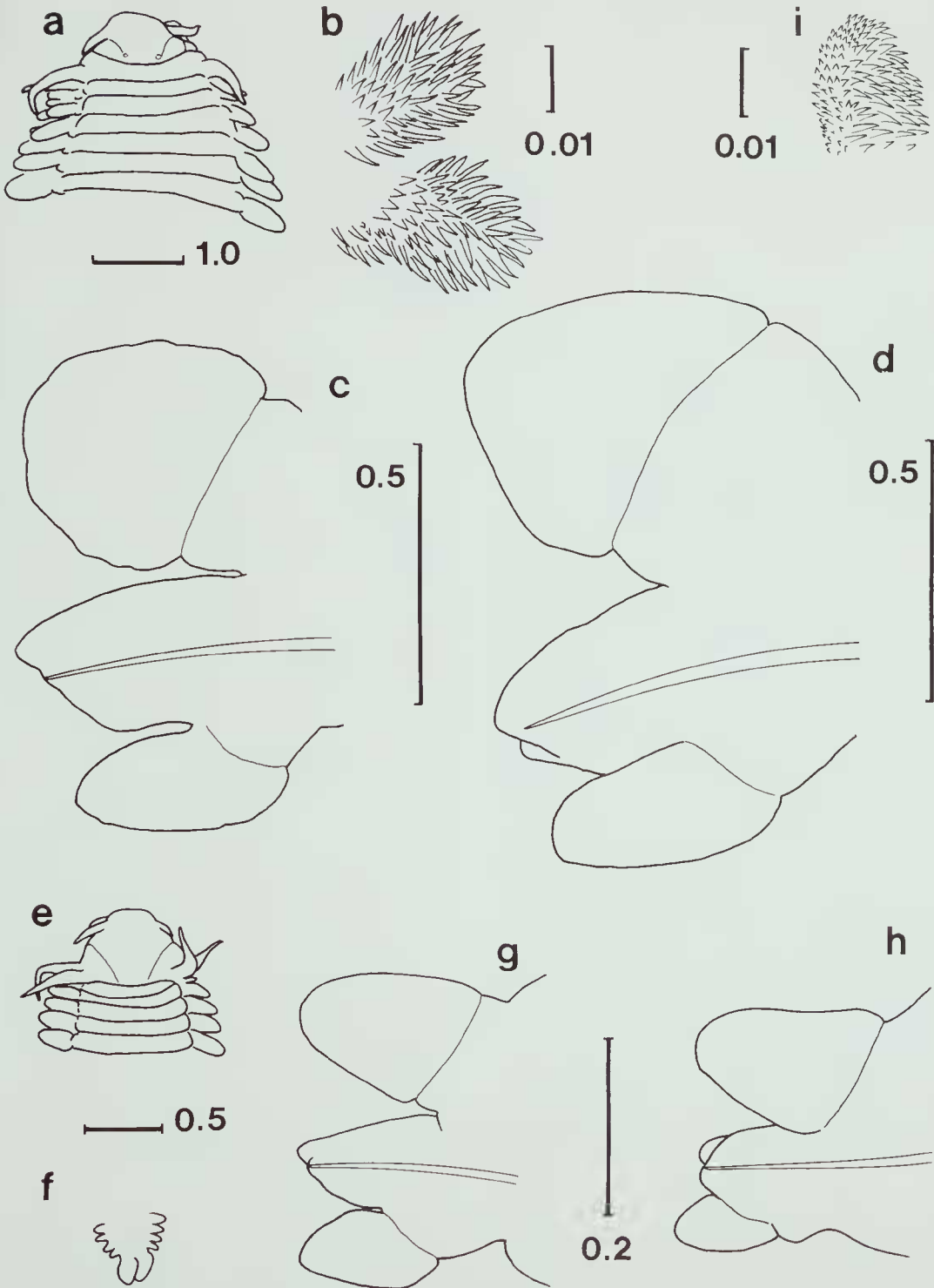


Figure 13. a-d, *Mysta maculata* USNM 18940 holotype: a, prostomium dorsal view; b, spinose pads from proboscis; c, setiger 10 parapodium posterior view; d, setiger 50 parapodium posterior view. e-h, *Mysta platycephala* HZM V-7928 syntype: e, prostomium dorsal view; f, anal cirri; g, setiger 11 parapodium anterior view; h, setiger 50 parapodium anterior view. i, *Mysta platycephala* NMV G1889 spinose pad from proboscis. Scale bars in mm.

***Mysta picta* Quatrefages**

Eteone picta Quatrefages, 1865: 147, pl. 18 figs 18–23. Brehat, Bretagne, France.

Eteone (Mysta) picta. – Fauvel, 1923: 176, 177, figs 64a–g.

Remarks. The following description is taken from Fauvel, 1923: Proboscis with 2 lateral rows of large papillae, dorsal band of small denticulate papillae and a ventral semicircle of 20 lanceolate papillae. Dorsal and ventral tentacular cirri similar in length. Dorsal cirri circular to kidney shaped, wider than long except on posterior segments. Articulation of setae with pair of large teeth and series of smaller teeth. Anal cirri ovoid.

Bergström (1914) was uncertain as to whether *Mysta picta* was synonymous with *M. syphodonta*, however the form of the dorsal cirri, which are longer than wide in *M. syphodonta* but circular to kidney-shaped in *M. picta*, readily separate the two species; the two were regarded as distinct species by Fauvel (1923) and Uschakov (1974). Hartman (1959) synonymised *Eteone armata* Claparède, 1868, *E. incisa* Saint-Joseph, 1888 and *E. striata* Bobretzky, 1868 with *Mysta picta*, and the same author also treated *E. geoffroyi* (Audouin and Milne-Edwards, 1834) as a questionable synonym of *M. picta*.

Distribution. Mediterranean, Atlantic coast of France and English Channel (from Fauvel, 1923).

***Mysta platycephala* (Augener) comb. nov.**

Figures 13e–i; plate 3d

Eteone platycephala Augener, 1913: 136–138, pl. 3 figs 44, 45, text-figs 9a, b. Shark Bay, Australia. – Knox and Cameron, 1971: 23. Port Phillip Bay, Victoria.

Eteone sp. 1 Poore et al., 1975: 51. Port Phillip Bay, Victoria.

Material examined. Australia. Western Australia. North-west Shelf, 7 stations, 1982–1983, 39–88 m, coll. CSIRO, AM W200916–W200917, W200921, W200934, W200978–W200979, W200986, 7 specimens. North-west Shelf, 2 stations, 1983, 30–42 m, coll. CSIRO/Poore and Lew Ton, NMV F52624–F52625, 2 specimens. Shark Bay, NW of Middle Bluff, Stn 1, 7–8 m, 21 Sep 1905, HZM V-7928, 1 syntype. Mermaid Sound, Dampier Archipelago, Stn AC, 13 Feb 1981, coll. Meagher and assoc., WAM 32-86, 1 specimen.

South Australia. Upper Spencer Gulf, stn B10, 16 Sep 1973, S. Shepherd, AM W5986, 1 specimen. Spencer Gulf, 16 km SW of First Creek, Port Pirie, 1980, coll. T.J. Ward and P.C. Young, subtidal *Posidonia*, 2.8 m, AM W202402, W202445, 2. Spencer Gulf, 8 km SW of First Creek, Port Pirie, 1979, coll. T.J. Ward and P.C. Young, bare sediment, 13.4 m, AM W202446, 1.

Victoria. Port Phillip Bay; Port Phillip Survey Area 5 Stn 169 (see Black, 1971 for habitat data), NMV G1889, 1 specimen (material of Knox and Cameron, 1971); 4 km ENE of Point Wilson, MMBW Stn B2, 19 Apr 1983, NMV F52626, 2 specimens; PPBES stn 913, 10 Jun 1971, NMV F52627, 1 specimen; PPBES stn 922, 10 Jun 1971, NMV F52628, 1 specimen; PPBES stn 928, 2 Nov 1972, NMV F52629, 1 specimen; PPBES stn 985, 9 Dec 1971, NMV F52630–F52632, 4 specimens and SEM stub NMV F53946 whole mount of 1 of 2 specimens from NMV F52632; (PPBES material = *Eteone* sp. 1 of Poore et al., 1975; see Poore, 1986 for full locality details). Eastern Victoria; FVWSB SWOP81 stn 1281, coll. Marine Science and Ecology (Vic.), 1 specimen.

New South Wales. Murrays Basin (NSW State Fisheries collections): stn 40, Apr 1972 AM W194234, 1 specimen; stn 154, sand, 17 Oct 1972, corer, AM W194489, 2 specimens; stn 165, sandbank, 17 Oct 1972, corer, AM W194276, 1 specimen; stn 169, sand, 17 Oct 1972, corer, AM W194301, 2 specimens; stn 185, sandbank, 9 Oct 1972, AM W194424, 4 specimens.

Queensland. Gladstone Harbour, site 19, dredge, 6 Nov 1975, coll. P. Saenger, QM GH3571, 1 specimen; Peel Island, Moreton Bay, 0.8 km S of wrecks, 7.6 m, sand-shell-grit, Sep 1970, QM G10438, 1 specimen. Middle Banks, northern Moreton Bay: grab, Jul/Aug 1982, coll. I. Poiner, QM GH3595, 3 specimens; grab, Nov 1983–Nov 1984, coll. P. Saenger and S. Cook, QM GH3611, 2 specimens; stn 33, grab, 11.6 m, sand, Dec 1973, QM GH3652, 1 specimen; stn 28, grab, 21 m, sandy-mud, coll. S. Cook, Dec 1973, 1 specimen; stn 47, grab, 29 m, mud, Jun 1973, coll. S. Cook, QM GH3679, 1 specimen; stn 51, grab, 30.5 m, mud, Mar 1974, coll. S. Cook, QM GH3650, 1 specimen.

Description. Size range of material examined: 58 segments, 5.5 mm long, 0.3 (0.4) mm wide at segment 10 to 164 segments, 40 mm long, 0.9 (1.4) mm wide (entire specimens). Prostomium trapezoid, two-thirds as long as wide, strongly dorsoventrally flattened, with rounded anterior margin, partly enclosed posteriorly by lateral expansion of first segment. Prostomium thus achieves maximum width in median region, anterior and posterior margins both about half maximum width. 2 pairs of antennae anteriorly located and most easily seen in ventral view, as long as anterior width of prostomium. Eyes not visible in type material but 1 pair of red eyes close to posterior margin of prostomium present in most other specimens. No nuchal papilla (fig. 13e). Tentacular cirri equal in length or with dorsal pair slightly longer than ventral pair and about two-thirds as long as width of first segment. Proboscis (retracted in all specimens) extends back to about segment 12, with row of 10–15 triangular papillae along each side (10 in the syntype examined here), papillae largest in median regions, smaller at either end of row and extending over almost full length of proboscis excepting only extreme basal

and distal ends. Proboscis also with dorsal band of small papillae arranged in transverse rows, each papilla with about 20 long teeth (fig. 13i). Conspicuous fleshy "gizzard-like" structure follows proboscis and extends back to about setiger 18. Second segment with setae, conical neuropodia and ventral cirri both with rounded tips, ventral cirri about twice as long as neuropodia. Dorsal cirri present from segment 3, carried on short pedicel, triangular-lanceolate in shape with rounded tips and of similar length to other lobes on anterior segments, slightly longer and larger than neuropodia and ventral cirri on median and posterior segments. Neuropodia and ventral cirri lanceolate lobes from setiger 3, similar in size and proportions on all subsequent segments (figs 13g, h). Anal cirri digitiform, about 3 times as long as wide (fig. 13f). Setae with pair of large teeth at articulation and 2 rows of successively smaller teeth (pl. 3d).

Remarks. Augener (1913) stated that he had two specimens before him on which the original description was based: one entire specimen and one posterior fragment with the head missing. The type specimen examined here is therefore one of two syntypes, albeit the only specimen complete with a head. The number of segments and dimensions agree exactly with Augener (1913). The structure of the proboscis has not previously been described and the syntype had not been dissected to reveal the proboscis prior to my examination of the specimen. Two specimens from Spencer Gulf, South Australia (AM W202402, W202445), have abnormal probosces: each paired row of triangular papillae is fused into a longitudinal fleshy ridge. These two specimens are identical in other respects (the form of the prostomium, parapodia and setae) to the remaining material and I have concluded that the abnormality of the proboscis is of no taxonomic significance. Except for occasional variations in pigmentation (some specimens have a single broad brown transverse band on the dorsum of segments 4-6) all material otherwise agrees with the type specimen and original description of Augener, 1913.

The form of the proboscis, prostomium, dorsal cirri and setae clearly place this species in the genus *Mysta* and *M. platycephala* is thus proposed here as a new combination.

Distribution. Widespread in Australia: north-western Australia, Victoria, and Queensland, particularly from embayments and inshore waters (but not collected during an extensive survey of the continental shelf of Bass Strait, south-eastern Australia—Wilson and Poore, 1987). Variety of

sediments, 2–88 m. Also recorded from New Zealand (Augener, 1924: 308; Augener, 1927: 344).

Mysta syphodonta (delle Chiaje)

Lumbricus syphodonta delle Chiaje, 1822 [not seen] Gulf of Naples.

Eteone (Mysta) siphonodonta (sic.).—Fauvel, 1923: 178, fig. 63e-h.

Mysta siphonodonta (sic.).—Bergström, 1914: 205–207, fig. 78a, b.

Remarks. Delle Chiaje's material appears to be lost (K. Fauchald, pers. comm.); the following brief description is taken from Fauvel (1923), who recognised *M. syphodonta* as distinct from *M. barbata* and *M. picta*. Proboscis with large papillae in 2 lateral rows, dorsal band of small denticulate papillae and narrow ventral band of small papillae. Dorsal tentacular cirri longer than ventral. Dorsal cirri ovoid, longer than wide and asymmetrical. Articulation of setal shafts with pair of large teeth and series of smaller teeth.

Distribution. Mediterranean and Adriatic Seas (Fauvel, 1923); recorded from the Black Sea by Mikashavidze (1981).

Mysta tchangsii Uschakov and Wu

Eteone (Mysta) tchangsii Uschakov and Wu, 1959: 8. Yellow Sea, China.—Uschakov, 1974: 173, 174, pl. 19 figs 1–6.

Eteone (Mysta) ornata.—Fauvel, 1933: 17, 18 fide Uschakov, 1974 (not Grube, 1878).

Remarks. The following brief description is taken from Uschakov and Wu (1979). Dorsum with violet coloured spots scattered irregularly, some specimens with blueish iridescent tinge. Prostomium without eyes, small nuchal papilla present; dorsal tentacular cirri longer than ventral pair. Proboscis with lateral rows of large papillae over all but the extreme basal section, orifice with single large teat-like papilla dorsally and surrounded by ring of small digitiform papillae. Dorsal cirri ovoid and carried on large pedicels. Setae with 2 large teeth unequal in size and series of smaller teeth.

According to Uschakov (1974) and Uschakov and Wu (1979) *Mysta tchangsii* differs from *M. ornata* and *M. syphodonta* only in coloration, but the description provided by Uschakov and Wu suggests that the large dorsal papilla at the orifice of the proboscis and the setae with large teeth of unequal size also distinguish this from related species.

Distribution. Yellow Sea and South China Sea, China and India (Uschakov, 1974).

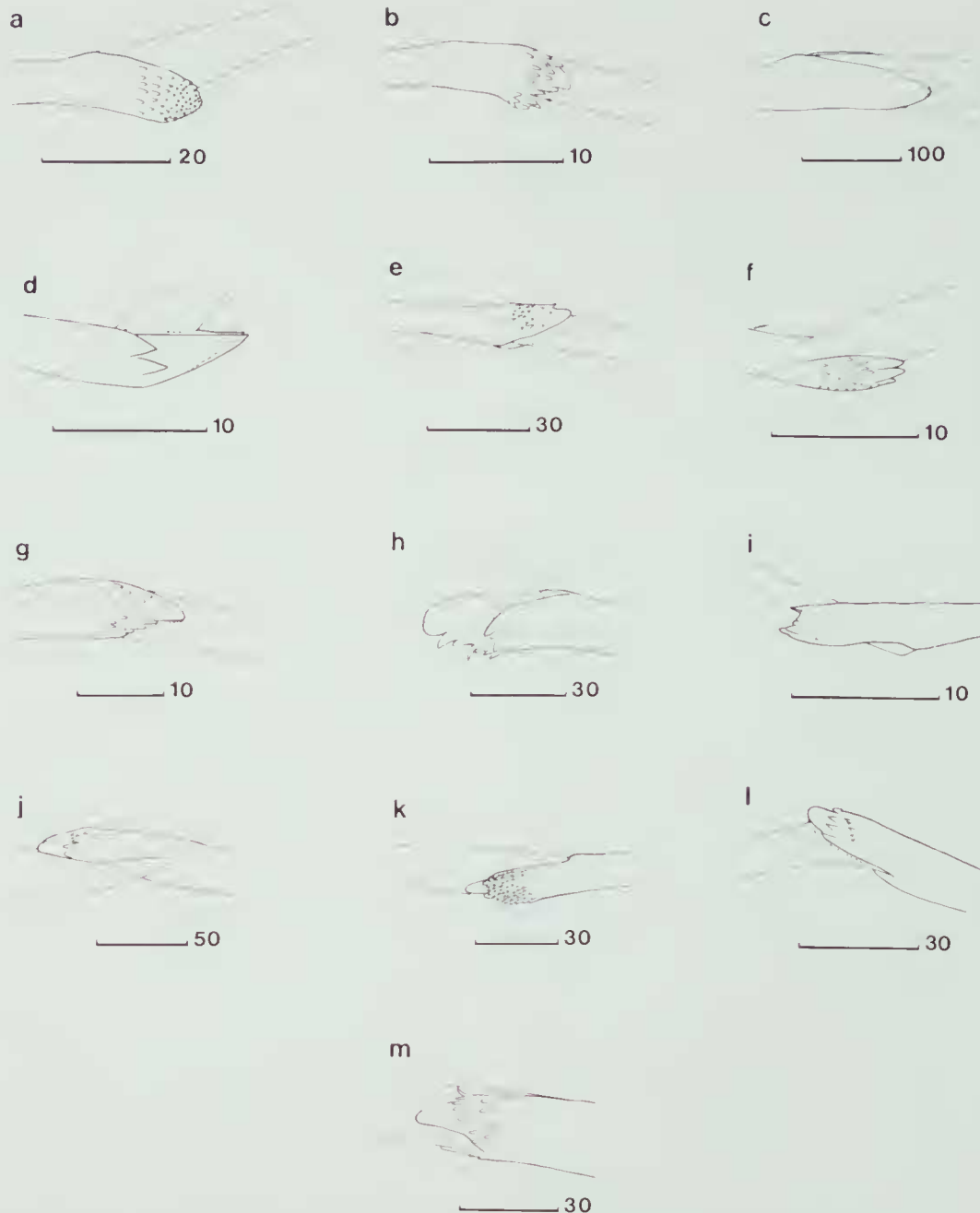


Figure 14. Setae of species of *Eteone*, *Hypereteone* and *Mysta*. a, *E. balboensis* USNM 20337 holotype (from median setiger); b, *E. californica* USNM 20339 entire specimen of 2 syntypes (from setiger 15); c, *E. fucata* ZMO syntype (from median setiger); d, *E. japonensis* BMNH ZK1921.5.1.1059 holotype (from setiger 15); e, *E. sculpta* HZM V-1205 holotype (from setiger 27); f, *E. spilotus* USNM 57959 larger of 2 paratypes (from setiger 10); g, *E. trilineata* USNM 441 syntype (from setiger 11); h, *H. alba* USNM 493 lectotype (from setiger 10); i, *H. alba* USNM 493 larger of 2 paralectotypes (from setiger 10); j, *H. lighti* USNM 20333 entire specimen of 2 syntypes (from setiger 10); k, *H. otati* AM W201455 holotype (from about setiger 97-100); l, *M. barbata* SMNH 2417 holotype (from setiger 20); m, *M. maculata* USNM 18940 holotype (from setiger 20). Scale bars in μm .

Mysta sp.

Eteone (Mysta) siphodonta.—Day, 1967: 140, fig. 5.1a–e. False Bay to Natal, South Africa (not delle Chiaje, 1822).

Remarks. The following description is taken from Day (1967): Proboscis with large papillae in 2 lateral rows and dorsal band of small denticulate papillae. Dorsal tentacular cirri longer than ventral. Dorsal cirri ovoid, longer than wide. Articulation of setal shafts with pair of large teeth and series of smaller teeth.

Day (1967) found that South African material which he referred to *Mysta siphodonta* lacked the ventral band of proboscidial papillae which according to Fauvel (1923) are present in Mediterranean specimens. Day's fig. 5.1d indicates that the dorsal cirri are symmetrical in contrast to the asymmetrical dorsal cirri seen in material from the type locality. These differences indicate that the South African records may represent an undescribed species.

Distribution. South Africa, False Bay to Natal.

Key to Australian species of *Eteone*, *Hypereteone* and *Mysta*

1. Body of adult worms narrow, threadlike (c. 0.2 mm wide); anal cirri spherical globes *Eteone filiformis*
- Adult worms not threadlike (>0.5 mm wide); anal cirri digitiform or cirri-form 2
2. Setae present from second segment; anal cirri digitiform (no more than 4 times as long as wide) 3
- Setae present from third segment; anal cirri at least 5 times as long as wide, tapering to pointed tip *Hypereteone* 5
3. Proboscis with 2 rows of lateral foliose papillae; dorsal cirri carried on distinct pedicel *Mysta platycephala*
- Proboscis smooth basally, rugose distally, without lateral rows of papillae; dorsal cirri not carried on distinct pedicel 4
4. Dorsal cirri expanded posteriorly, becoming twice as long as ventral cirri; anterior dorsum with prominent transverse dark brown bars *Eteone palari*
- Dorsal cirri similar in length to ventral cirri throughout; dorsum without striking pigmentation *Eteone tulua*
5. Length of prostomium equal to maximum width; dorsal cirri longer than ventral cirri on posterior segments; body coloured bright yellow
- Prostomium twice as long as maximum width; ventral cirri longer than dorsal cirri on posterior segments; body pale cream-white *Hypereteone tingara*

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Appendix

Eteone nomina dubia

Eteone cylindrica Ørsted

Eteone cylindrica Ørsted, 1842: 122. Greenland.

Remarks. *Eteone cylindrica* was recognised by Hartman (1959) as a potentially valid species, however the original description is inadequate and the type material is apparently lost (F. Pleijel, pers. comm.); I regard this as a *nomen dubium*.

Eteone maculata Ørsted

Eteone maculata Ørsted, 1843: 29-30, figs 5, 6. Denmark.

Remarks. *Nomen dubium*. Poorly described and type material apparently lost (K. Fauchald and F. Pleijel, pers. comm.).

Eteone pusilla Ørsted

Eteone pusilla Ørsted, 1843: 30, fig. 84.

Remarks. Ørsted's original material cannot be located (K. Fauchald and F. Pleijel, pers. comm.). The original description is not sufficiently detailed to be confident of the specific identification, however the subglobular anal cirri described by Ørsted (1843) indicate that this species belongs to either *Eteone* or *Mysta* as defined in this paper.

Eteone setosa Verrill

Eteone setosa Verrill, 1873: 588. Massachusetts, USA.

Remarks. Pettibone (1963) synonymised *Eteone setosa* with *E. lactea*, which would place Verrill's species in the genus *Hypereteone* as defined here. Verrill's types however remain lost (Hartman, 1942 and W.D. Hartman, pers. comm.) and I regard *E. setosa* as a *nomen dubium*.

Eteone tocaninensis Nolte

Eteone tocaninensis Nolte, 1938: 240. Atlantic Ocean, tropical.

Remarks. This species is dubiously placed in the genus *Eteone* since it has only a single pair of ten-

tacular cirri. Known only from 6 setiger post-larval stage (other species of *Eteone* figured by Nolte (1938) have 2 pairs of tentacular cirri at earlier developmental stages).

Distribution. Equatorial Atlantic Ocean, latitude 48°30'W.